

# Municipal Journal

Volume XXXVII

NEW YORK, OCTOBER 8, 1914.

No. 15



BALTIMORE ENGINE COMPANY NO. 3, TRUCK COMPANY NO. 1 AND HIGH PRESSURE SERVICE HOSE COMPANY NO. 1.

## BALTIMORE'S FIRE DEPARTMENT.

**Protects More Than Nineteen Thousand Acres—Force and Equipment Used—Cost of Operating Motor Apparatus—Repair Shop—School for Firemen—High Pressure System**

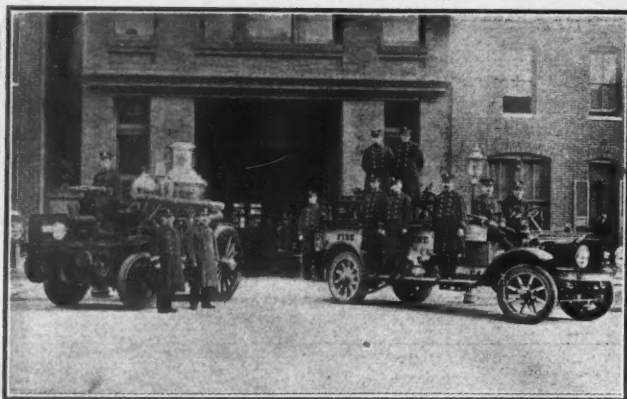
Numerous improvements in the ten years since the "big fire" have given Baltimore a very efficient and up-to-date fire department. Among the more notable improvements of the past few years have been the installation of the high pressure system, rapid motorization of the department, the introduction of a system of building inspection and fire prevention and the establishment of a school for the instruction of young firemen, probationary members, etc. As a result of all these improvements, the fire losses have rapidly decreased, and with an area of 19,290 acres and a population in excess of 600,000, the fire losses for 1913 were somewhat less than half a million dollars.

The total force of the department consists of 790 men and 75 substitutes, extra men, etc. At the head is the Fire Commission, composed of R. H. Johns, Isaac Frank and S. F. Manning. There are, in addition, Chief Engineer August Emrich, Deputy Chief L. H. Burkhardt,

8 district engineers, 1 superintendent of machinery, 1 captain commanding the marine division, 49 captains, 64 lieutenants, 41 enginemen, 48 assistant enginemen, 4 pilots, 12 tillermen, 12 assistant tillermen, 56 hostlers, 50 assistant hostlers, 276 pipemen, 108 laddermen, 11 stokers, 20 probationary firemen, 1 blacksmith, 3 machinists, 1 woodworker, 1 painter, 3 helpers, 1 telegraph superintendent, 6 telegraph operators, 4 telephone operators, 1 lineman, 4 assistant linemen and 1 batteryman.

The equipment consists of 39 engines, with 8 in reserve, 60 hose wagons and 2 in reserve, 19 hook and ladder trucks with 5 in reserve, 2 water towers, 9 fuel wagons, 12 chief's cars, 9 Concord wagons and 1 automobile truck in reserve, 4 linemen's wagons, 2 construction trucks, 1 White fireman's ambulance, 1 White supply truck, 1 Mack supply truck, 1 horse ambulance, 2 commissioners' carriages and 1 supply truck.

Of these, the horse drawn apparatus consists of 45 hose



ENGINE COMPANY NO. 5. LA FRANCE ENGINE WITH COUPLE GEAR TRACTOR, AND AUTO HOSE.

wagons, 29 engines, 14 trucks, 2 water towers, 2 construction trucks, 9 fuel wagons, 4 linemen's trucks and repair wagons and one horse ambulance. There are now 237 horses in service and 35 in reserve. During the past year 3 horses died and 15 were disposed of.

Motorization has been going on steadily for about three years and there are now in the department 12 chief's cars, one of which is held in reserve, 15 hose wagons with an additional one in reserve, 5 gasoline driven hook and ladder trucks, 1 gasoline driven pumping engine with hose and chemical, 5 gasoline driven steam pumping engines, 5 tractor drawn steamers; 2 repair wagons, 2 supply trucks, 1 fireman's ambulance and 1 couple gear driven electric tractor steam fire engine. The equipment put in use this year includes 5 chiefs' cars; 2 White, 1 Mack and 1 Lord Baltimore hose wagons; 1 first size Ahrens-Fox pumper; 7 Christie tractors, and one Ahrens-Fox, 1 American-La France and 1 White tractor. To completely motorize the balance of the department will cost, it is estimated, \$304,700.

Figures given out by the department in regard to the cost of operation compared with the cost for feeding horses for similar pieces of apparatus for a period of six months are:

Cost of chief's car, \$32.60; cost of horse drawn wagon, \$144.

Cost of an automobile hose wagon, \$20.56; for horse drawn wagon, \$144.

Cost of operation for a motor driven fire engine, \$38.60; for a horse drawn fire engine, \$216.

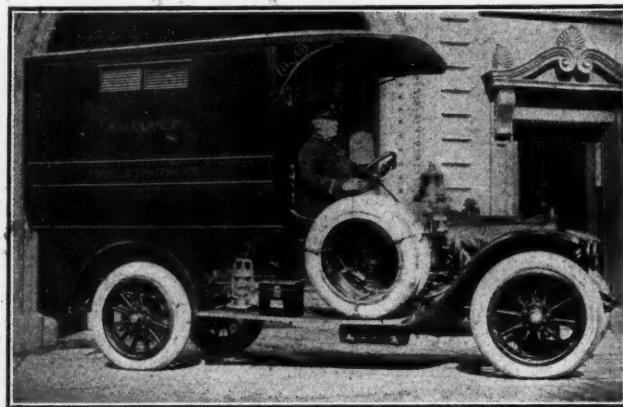
Cost of operation of a motor driven truck is \$29.88; for a horse drawn truck, \$216.

These figures include only the cost of fuel and oil for the motor cars and of feed for the horses. Repairs, tire

wear, depreciation, etc., are excluded, as Chief Emrich thinks it is impossible to judge tire or machine wear or depreciation on the basis of a six months' trial, when motor driven machinery, well cared for and carefully used, should last ten or more years.

The marine department consists of two fireboats, Deluge and Cataract, a marine captain, 2 lieutenants, 2 mates, 4 pilots and about 40 men. The Deluge is a modern fireboat built in 1911 and is 120 feet long, 28 feet wide and draws 10 feet of water. She is fitted with centrifugal turbine driven pumps and has a capacity of 12,000 gallons per minute. The Cataract, a smaller boat, was built in 1891, rebuilt in 1897 and again in 1913. She is 86 feet long, 20 feet wide, has a draft of 10 feet and is equipped with double vertical 9x10 pumps and in addition has two Ahrens-Fox pumps, giving a total capacity of 7,500 gallons per minute.

The department conducts a school for the firemen and all the probationers are obliged to take the course, which includes practice drill of all sorts, work with the ladders, life nets and other apparatus, an acquaintance with the various parts of the different machines, their use and construction. In addition a series of lectures are prepared by Chief Emrich and delivered by the officer in charge of the squad. Special preparations are made for examinations and exceptionally high ratings are the rule. Entrance to and promotion in the department are by civil service.

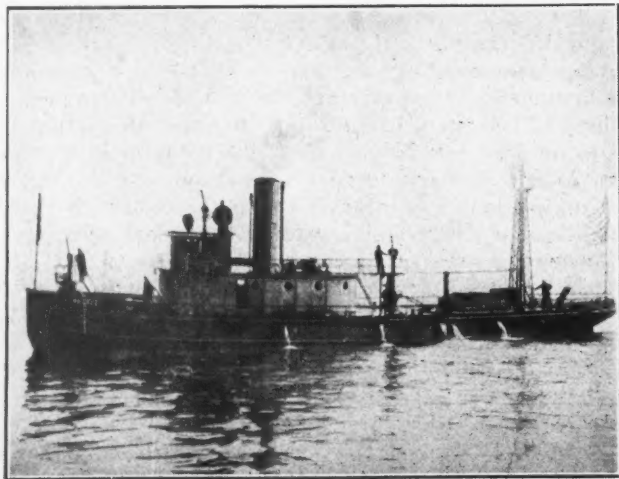


FIRE DEPARTMENT AMBULANCE.

During the past year a fire prevention bureau was established under the command of Captain McKnew and at the same time a general system of building inspection for the purpose of reporting violations of the building laws was begun. The fire prevention bureau, which effected a material reduction in the fire hazards, made 2,515 inspections and reported 518 violations. The bureau of building inspection made 3,800 inspections and reported 644 violations. Prompt action was taken by the department in all cases.

The department repair shop has been a factor in maintaining the efficiency of the department at a low cost, although it has been in service now only about a year. There is a blacksmith shop with a forge, a paint shop, a turning lathe, a planer and other equipment. Three machinists, a blacksmith, a woodworker, a painter and three helpers are employed in the shop. Here all the department equipment is painted and repaired. Under Chief Emrich's direction, the workmen in the shop have attached tractors to engines and trucks, thereby effecting a considerable saving. Plain chasses are bought and bodies from horse drawn hose carts are set on them. By this means a saving estimated at over \$1,500 is made on each piece of apparatus.

The high pressure system, a description of which was given in Municipal Journal of July 6, 1910, page 3, has



FIRE BOAT "DELUGE" IN ACTION.



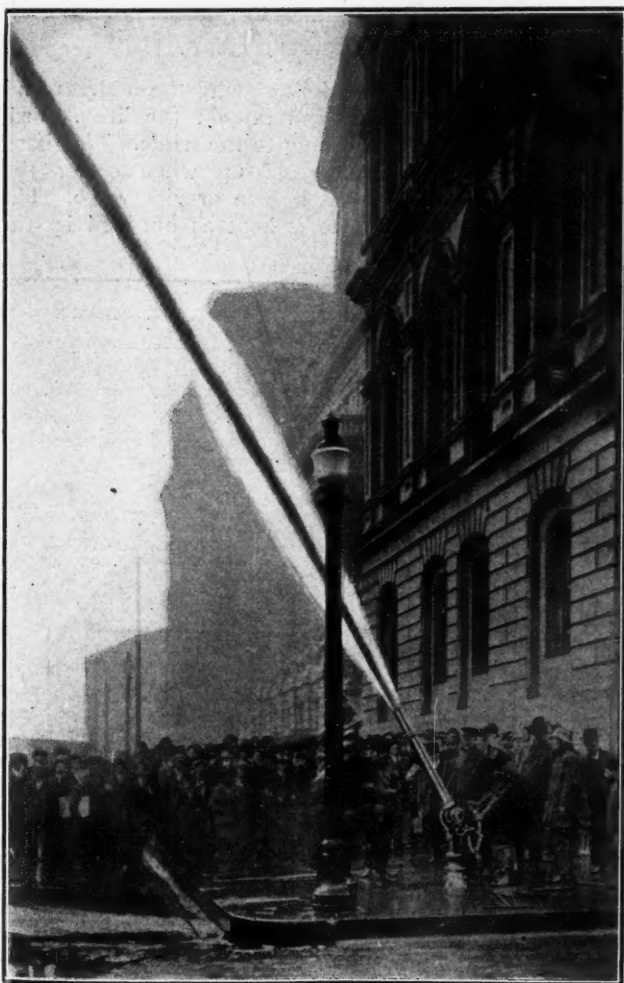
been one of the factors in the efficiency of the department. The area covered by the mains of the pipe line system is bounded by Pratt, Eutaw, Franklin, Howard, Saratoga, Gay, Baltimore and South Streets and covers about 170 acres of land. The total length of the mains is 8.856 miles, which includes .066 mile of 30-inch, .025 mile of 24-inch, 3.24 mile of 16-inch and 5.30 mile of 10-inch mains, and 2 miles of 8-inch hydrant branches. These pipe lines, including valves, hydrants and other fittings, were tested and made tight before back-filling, at a pressure of 600 pounds per square inch.

All valves are generally located on property lines, ordinarily four at each street intersection, so that in all but two or three cases any single side of a block may be cut out of service without interfering with the operation of any other part of the system.

The hydrants are of a specially designed flush type and are provided with a sidewalk cover, upon removal of which there can be connected to them a portable service head, which locks into position by a single turn. The heads have four 2½-inch outlets, each provided with a regulating valve so designed as to act as a shut-off valve, and with an outlet in the top of the head for monitor nozzle attachment. The total number of hydrants is 226.

A "Jumbo" monitor nozzle, with 2½, 3, 3½ and 4-inch tips, with a capacity of 7,000 gallons per minute, which can be operated by one man, is provided for direct connection on the hydrant.

Fresh water is used in the system, with harbor suction and connection for the fireboats in case of a break in the water supply or of a shut-down for any reason by the pumping station.



HIGH PRESSURE DEMONSTRATION, WITH MORSE JUMBO NOZZLE.



REPAIR SHOP, SUPPLY TRUCKS NOS. 1 AND 2.

The high pressure district is divided into ten inspection districts and the captains of the ten companies located within these 170 acres are each held responsible for the hydrants in his district. Daily inspections are made, snow is removed and, in case of very cold weather, salt is sprinkled around the edge of the cover to prevent it from freezing. The cover is so designed, however, that it can easily be broken in case it sticks and refuses to come off.

Steam from the exhaust of the pumping station of the high pressure system is used to heat the municipal buildings. All the electric light and power used in the city buildings also is furnished by the high pressure plant.

#### Fire Losses for the Past Six Years.

1908.....	1475	\$1,125,724.90
1909.....	1664	1,328,615.33
1910.....	1603	792,942.13
1911.....	1663	565,926.41
1912.....	1947	Est. 306,200.00
1913.....	1978	" 500,000.00

#### Appropriations for 1914.

Salaries .....	\$778,060
Apparatus and apparatus repairs, accidents and insurance .....	18,300
Feed, harness and horseshoeing.....	38,500
Fuel, electricity and gas.....	17,800
Furniture, office expenses, miscellaneous and store rooms.....	20,000
Hose, cable for subways, fire alarms and telegraph .....	35,000
Washing .....	6,750
Sick .....	5,000
Pensioners (regular), widows, etc.....	29,725
Pumping station and pipe care.....	18,500
Fireboats, fuel and oil.....	3,500

#### New Improvements for 1914.

Tractions for engines and trucks.....	\$12,000.00
Chasses for hose wagons.....	40,000.00
Automobiles for district engineers.....	6,000.00
Red lights, fire alarm boxes.....	5,000.00

Total appropriations.....1,034,135.00

#### Expenditures for 1913.

Salaries .....	\$ 751,932.03
Expenses .....	197,902.94
Salary, Truck Co. No. 18.....	7,191.11
High pressure service.....	14,538.82
Hydrant heads .....	5,775.61
Rebuilding fireboat "Cataract".....	46,302.61
Pumping station, boiler.....	15,000.00
Automobiles, district chiefs .....	6,000.00
Chasses, hose wagons.....	29,194.14
Tractors, engines and trucks.....	9,375.00
Repair shops, tools.....	4,000.00
Firemen's widows, etc.....	5,887.00

Total .....\$1,093,099.01





National Board of Fire Underwriters. The large card contains lines for recording a considerable number of data concerning conditions of the property, while on the back of the card a space is provided for a sketch of the basement showing the location of partitions and vertical openings, such as stairways, dummy-waiters and elevator shafts.

The department also uses the card form of running card in sending out the apparatus, on what is termed the unit index, divided into tens and hundreds. These cards are kept in a box with a lift cover. Chief Ringer's inspection system is reported to have proven very successful during the past three years in reducing the number of small fires and has probably saved a great many large fires by eliminating accumulations of inflammable rubbish.

## FIRE PREVENTION

**Danger Zones—Building Codes—Private and Public Fire Extinguishing Appliances—Control of Occupancy Hazard—State and Municipal Laws.**

The Committee on Fire Prevention of the American Society of Municipal Improvements, Alcide Chausse, chairman, presented at the convention of that society this week, as its report, a statement of the resolutions adopted and discussions held at the First American Fire Prevention Convention. Omitting the introductory paragraphs, the report is as follows:

*Topic No. 1—"Location" (Exposure Hazard).*

*Note*—Every building, and its contents in life and property, must stand on some finite, geographical spot; and carry to, and receive from, its environing property measurable fire hazards—hence this fundamental unit consideration.

*Resolution*—It is the sense of this convention that:

Fire is always local, originating from a definite cause in a definite property on a definite location; hence every building—in reasonable relation to its size, character, use and the congestion of its location—should be so constructed as to prevent the passage of fire from within to without and vice versa.

*Topic No. 2—"Zones of Danger."*

*Note*—The aggregate unit fire exposure becomes communal fire exposure—hence the consideration next in order of groups of unit exposures.

*Resolution*—It is the sense of this convention that:

Populous communities should be divided into danger zones; wherein rules reasonably limiting, defining and regulating the presence, form and use of property may be legally imposed, with due regard for the present and near prospective congestion of life and property in such areas.

*Topic No. 3—"Building Construction."*

*Note*—On any selected site the consideration next in order is the unit building fire hazard—in design, specification and construction.

*Resolution*—It is the sense of the convention that:

All building construction and reconstruction—having in view the present and near prospective congestion of its location and the range of occupancy proposed—should fully include in design, specifications, construction and appliances adequate safeguards against danger to life and property. All buildings should be required by law to be fitted with adequate fire exits and escapes proportioned to their human occupancy in accord with reasonable exit tests. Outside fire escapes are deemed the least desirable of all forms.

*Topic No. 4—"Building Codes."*

*Note*—The aggregate of unit building construction problems becomes the like community problem, or the Building Code (state or local).

*Resolution*—It is the sense of the convention that:

(a) All building construction and reconstruction should be under government control, state or local, to the end that the greatest safety for the greatest number for the present and future should be assured;

(b) Each of the several states should adopt a state building code with requirements which local governing bodies may raise but not lower by local enactment, said requirements to be enforced by proper governmental machinery over all and every state;

(c) The classification of building construction is entirely one of relative ability to resist attacks by fire, and therefore in all building codes the term "fireproof" should be replaced by "fire-resistant," and ordinary frame construction should be classed as "combustible";

(d) The National Fire Protection Association is hereby requested to recommend approved standards of fire-resistant construction which may be used by states and municipalities in their respective building codes.

[Section (d) was subsequently modified in its force and intent by resolution adopted under Topic No. 8, "Compulsory Physical Standards," whereby the recommendations of the National Fire Prevention Association and other originators of standards are to refer same for approval to the Bureau of Standards of the Department of Commerce of the National Government at Washington.]

*Topic No. 5—"Protection (Private)."*

*Note*—The best located and constructed unit building is now held to need protection (usually water supply and/or chemicals) to reasonably assure safety against fire for the building itself as well as for its contents in life and property—hence this consideration comes next in order after the actual construction (often with it).

*Resolution*—It is the sense of the convention that:

(a) Every building—for its own safety and that of its contents in life and property—should be fitted reasonably, with respect to its location, character and use, with proper mechanical aids to discover, alarm and extinguishing fire and to resist lightning; and

(b) The occupants of every building should be reasonably educated regarding the physical structure thereof, and how to leave same in a quick and orderly manner, and be organized reasonably to fight fire therein.

*Topic No. 6—"Protection (Public)."*

*Note*—Communal fire protection is essential in addition to all like private unit agencies—hence this topic in this place.

*Resolution*—It is the sense of the convention that:

(a) All communities need physically a sure water supply, broadly usable by citizens for private fire protection, under the least onerous terms—also adequate fire-fighting apparatus with proper personnel to operate same; also an adequate alarm system—all proportionate to the character, area and population of each community; and

(b) All fire-fighting forces should be efficiently organized in enduring form, under legal control and disciplined when possible—their morale and requirements should be high and solely influenced by good service considerations; and the training should be constant and adequate for efficient fire-fighting and fire-prevention inspection and the purchase and maintenance of the valuable special mechanical apparatus.

*Topic No. 7—"Equipment."*

*Note*—It is necessary to heat, light, ventilate and otherwise "equip" every unit building wherever located; and this equipment is all productive, and/or receptive, of fire hazard—hence its appropriate consideration at this point.

*Resolution*—It is the sense of the convention that:

All equipment for buildings should be adequately designed and constructed with respect to its fire hazard—productive or receptive—and that its use should be predicated on reasonable compliance with such requirements, and should be reasonably regulated everywhere by law.

*Topic No. 8—"Compulsory Physical Standards."*

*Note*—If the thought is sound that reasonable enforced laws are necessary to control the purely physical problems of so constructing, protecting and equipping buildings as to abate fire waste, then it becomes of maximum importance to define uniformly and precisely the not unduly burdensome technical physical things required in such laws by the best experience—hence this consideration at this point.

*Resolution*—It is the sense of the convention that:

In view of the growth of state laws and municipal ordinances to prevent the appalling loss of life due to fire and to control

fire waste by the widespread legal imposition of physical requirements upon construction, protection and equipment of buildings, it is now important that:

(a) Physical standards on this entire subject be formulated which may be generally and legally imposed without undue hardship or cost upon the public; and

(b) That the federal government through its Bureau of Standards of the Department of Commerce should arrange to review such standards for approval and promulgation in uniform language, to the end that they may be used by states and municipalities in laws and ordinances; and therefore be it further

*Resolved:*

(c) That the National Fire Protection Association be requested through its Executive Committee to arrange for a conference of delegates, with the chairman of this convention as chairman; from the American Society for Testing Materials, the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers, and all kindred national societies having standards bearing on this subject, for the purpose of collecting such standards for submission to the federal government; and be it further

*Resolved:*

(d) That the conference thus formed be requested to take the necessary steps to bring these resolutions before Congress and to secure the required legislation at the earliest opportunity.

*Topic No. 9—"Occupancy" and Topic No. 10—"Annual Occupancy."*

*Note*—Every use or "occupancy" of any building contains in itself an inherent fire hazard to that structure and its contents in life and property, and also to its environing community; hence consideration here of this danger in completed buildings.

*Resolution*—It is the sense of the convention that:

(a) The individual occupancy hazard (the relative fire hazard to life and property in any given building inherent in any given pursuit) should be definitely controlled as to construction by the building code; and as to management by proper police (or equivalent) continuous regulation to assure reasonable safety of life and property therein;

(b) The general occupancy hazard (the relative community hazard inherent in any given pursuit) should be definitely controlled in every populous community by law, which should exclude extra hazardous pursuits, and properly place and safeguard by appropriate rules permissible hazardous pursuits in their appropriate danger zone (or other like delimited area); and

(c) The control of occupancy conditions, through requirements imposed by law, is essential for the abatement of fire waste of life and property; and this control to be actual and effective should cover all property (at least in cities) and continuously—at least once annually—and upon every substantial change of tenancy, through the agency of an occupancy license based upon competent legal inspection by the fire-fighting force or an adequate similar agency.

*Topic No. 11—"Management."*

*Note*—The preceding topics all dealt almost exclusively with physical means to control and prevent fire waste. This topic considers the moral as well as physical subject of cleanly and orderly daily living in property and its beneficial influence in abating and controlling fire waste.

*Resolution*—It is the sense of the convention that:

Based on evidence and opinions obtainable approximately one-half of all fire waste—including avoidable fires without fraud as well as arson fires—arises from ignorant, shiftless, dirty and vicious use of property (which condition causes an approximate-like proportion of sickness and immorality in all populous centers) and therefore minimum continuing requirements as to clean and orderly living and the suppression of dangerous fire-breeding nuisances (such as the snap match, dangerous smoking, careless storage of rubbish, ashes, etc.) should be imposed by law in all communities, through the agency of the police power, acting through state and municipal fire marshal (or like officials), using the active fire-fighting organization for inspections as much as possible and all volunteer aid procurable.

*Topic No. 12—"Legislation."*

*Note*—This topic considers the need and scope of legislation to control fire waste.

*Resolution*—It is the sense of this convention that:

While fire loss of life and property is always local in inception, its result is national in effect, and hence its control must be effected by the operation of a sum total of state and municipal laws which will suppress the range of fire hazards to an attainable minimum everywhere and all the time; and that by this course alone can the sum total of fire waste of life and property be speedily and substantially reduced, and the cost of fire insurance (which reflects this total loss) be lessened throughout the country.

*Topic No. 13—"Education."*

*Note*—No program can succeed unless understood by, and in sympathy with, the mass of people; hence consideration here of the problem of widely informing the nation about the physical phases of fire danger and waste and the imperative need of reasonable legal regulation on the subject.

*Resolution*—It is the sense of the convention that:

Education of the public about fire danger and waste of life and property should be provided in all laws, ordinances and regulations on the subject; and all interests concerned should not only join issue in collecting accurate and authoritative data, but make equal effort to disseminate this information regularly and continuously among all the people in readily understandable language, to the end that they may not only accept, but demand proper fire waste regulation and live in full accord therewith.

*Topic No. 14—"Insurance."*

*Note*—Despite all future effort and regulation some fire waste must continue, hence consideration here of insurance, or the distribution financially of this waste.

*Resolution*—It is the sense of this convention that:

(a) The several states, territories and provinces should not only assure that permissible fire insurance is stable financially, but that the form of contract should be as clear, brief, explicit and sound as possible and, as nearly as may be, uniform in substance in all these jurisdictions, to the end that all such policies permitted to issue throughout the country may equally and adequately protect all citizens, including the ignorant and inexperienced; and

(b) Said jurisdictions should as nearly as possible adopt uniform regulations governing:

1. Issuance of fire policies on property.
2. Licensing of fire insurance agents and brokers, and
3. Licensing of fire insurance adjusters:

To the end that only reasonable insurance contracts will be permitted on property, and that only men of sound character will be admitted to the business of writing fire insurance and adjusting fire losses, thus discouraging arson and complicity with fraudulent losses.

## FIRE PREVENTION INSPECTION.

By KARL W. DETZER.

The Board of Public Safety of the city of Fort Wayne, Ind., has established a system of fire prevention inspection that brings the officials into constant touch with every building within the fire limits, and every structure of three stories or over in the city limits.

Captains of the eight engine companies use two entire days each week inspecting their districts, working in pairs, and covering each building, each alley and each back yard carefully. The organizations of retail merchants, labor unions and of professional men were conferred with, and agreed with the city authorities that the inspections would lessen fire risks to a great extent. At first the inspectors were opposed in certain quarters, but a visit or two from the fire chief or his assistant, and from a deputy fire marshal, overcame this difficulty.

The semi-weekly inspection day gives the fireman an opportunity to visit every building at least once a month, and where it is necessary, once a week. From the very beginning the results have been apparent.

Firemen found hundreds of basements in the very center of the business district filled with old papers and



cily rags. These they ordered removed. Alleyways were cleared of trash and wooden ash boxes were ordered out at once. Furnaces without metal and asbestos protection between them and ceilings were to be found everywhere at the beginning of the work, but now there is not one such furnace in the city. Electric drop lights with insulated wiring hung over nails or hooks were ordered changed at once. Cellar gratings in the sidewalks were made easily removable in case of fire, and chimneys were given severe tests.

Thirty gasoline tanks were ordered out and placed underground and fifty fire escapes were placed on buildings. Chemical extinguishers were suggested to owners of buildings containing inflammable materials, and in most places the suggestions were acted upon. Gasoline stoves were ordered out of a number of old and dangerous tenement buildings, and they have been kept out.

Not an electric light, telephone or telegraph wire remains on Calhoun street, the main business street of the city. Before the board took up the matter of wires, it was impossible to raise a high ladder in dozens of places along the street, but now there is not a window that cannot be reached.

The success met by the fire captains in their fire prevention inspection led the officials of the International Business College, an institution situated in a five-story building and with about six hundred students, to ask the firemen to take charge of their fire drills. The city department, therefore, manages every drill at the school, and a perfect military organization has resulted.

First and second lieutenants have been appointed in every engine house, and on the day the captain of a house is on inspection, the first lieutenant is in command. This averts confusion and maintains discipline.

Few property holders object to the requests of the inspectors, and those who do are reported to the city chief and the state fire marshal, whose orders never have been disobeyed.

## PREVENTION IN VARIOUS CITIES

### Organizations Employed and Work Done by Them—

#### Special Risks Which Receive the Most Attention—

#### Responsibility of Owners.

During the past few years great strides have been made in fire prevention and building inspection. This is more especially the case in the larger cities, though of late the smaller cities have followed suit. Chicago has, perhaps, the best equipped and most complete department for this work, although other cities, notably Baltimore and Washington, have a definite department devoted to it.

The working force of Chicago includes one chief of department, one fire prevention engineer, four assistants, one clerk, two stenographers and 26 inspectors. Chicago is practically the only city that maintains a department of this size, though Washington has a department under the charge of the fire marshal, whose duty it is to inspect all buildings. Baltimore has a fire prevention and inspection squad, but these men, like the Washington department, are a part of the regular force of firemen. Other cities doing the same work are Norwich, Conn.; Philadelphia; New York; Wheeling, W. Va.; Urbana, Ill.; Hartford, Conn.; Newark, N. J.; Denver, Colo.; Boston and Pittsburgh.

At Chicago thorough inspections are made, and when violations are found to exist, they are reported to the clerk, who mails proper notices to the owner and person responsible. When violators show no disposition to comply after sufficient time is given, action is com-

menced by the prosecuting attorney. The following were the operations for the last fiscal year:

Original buildings inspected.....	9,811
Number of premises in violation.....	8,963
Number of premises not in violation.....	848
Number of reinspections.....	15,829
Number of theatre inspections.....	34,410
Number of fire drills supervised.....	148
Tanks or tank installations for volatile oil inspected .....	909
Suits started on above.....	657
Cases non-suited when violations were corrected .....	321
Fined .....	11
Suits pending.....	283
Dismissed on account of change of ownership or vacation of premises.....	42

Hartford, Conn., while it has not the facilities for inspection, etc., of the larger cities, sent Deputy Chief Dahill to Boston last fall to spend two weeks on duty in the department of that city studying its fire prevention system.

The Fire Department of Washington, D. C., last year made 25,374 inspections of mercantile establishments, hotels, apartment houses, office buildings, cellars, etc., to see that all conditions liable to cause or promote a fire were remedied. Moving picture theatres are under the direct supervision of the department. Theatres were inspected regularly once or twice a week and the fire equipment and appliances regularly tested. All scenery is treated with a fire resistant solution. The storage and sale of inflammable oils and explosives are also under the control of the department.

Baltimore started the system only a year or so ago, but the results have been surprising. A greater appropriation is promised for next year, when the scope of the department will be enlarged.

In Philadelphia the inspection is under the control of the fire marshal and during the past year more attention has been paid to it. In Newark especial care is taken in the downtown districts to keep the basement of stores, etc., free from rubbish and waste.

Urbana, Ill., is among the foremost of the smaller cities in this respect, and has adopted a set of rules for fire prevention recommended by Fire Marshal W. Roughton. With the small force available, however, few inspections can be made.

All European nations are ahead of the United States in the matter of fire prevention, though probably a corresponding distance behind in fire protection. Germany, for instance, calls fire a crime. If a person has a fire in his house or store, he is charged with a crime and must prove to the authorities that he is in no way responsible either by carelessness or design. Unless innocence is proved, no insurance can be collected and, more than this, he must pay the fire department for the time required to put out the fire. Moreover, by virtue of the common law, they hold that, if by carelessness or design one is responsible for the burning of a neighbor's property, he must pay for that also.

New York City had an old law requiring payment to the fire department for fires such as chimney burning and other small blazes. About the only charge that has been made in the past is \$25 for attending to a blazing chimney, but Joseph O. Hammitt, chief of the Fire Prevention Bureau, has determined to act under a charter provision which, he believes, gives him authority to recover from owners or occupants for the cost of extinguishing all fires for which they are in any way responsible, as stated in previous issues of Municipal Journal.

Building inspection in Petaluma, Cal., is performed by the chief of the fire department—at present R. S. Adams. He reports that during the year ending July

29 he inspected nearly all of the mercantile buildings, including hotels, theaters, garages, lumber yards; also all schools and churches. He also has the granting of permits for building repairs and for storage of inflammable materials. At the end of the last fiscal year there were in operation 57 permits for gasoline, 3 for benzine, 37 for kerosene, 6 for petroleum and 1 for other oils, these permits covering a total amount of 194,680 gallons. He also has control of the locating of fire hydrants.

## NORWICH, CONN., FIRE DEPARTMENT

### Apparatus and Force of a Medium Size City—Motor Combination Renders Most Service—Cost of Operating—Old Hand Engine

Norwich, Conn., a city of about 30,000 inhabitants and covering 3,650 acres of land, had, during the past year, 243 fires, causing a total loss of \$46,378.29, all but \$900 of which was covered by insurance. This is a relatively small loss for a city the size of Norwich and may be explained, perhaps, by the excellent work of the fire department and by the provisions taken for fire prevention.

The personnel of the department includes the chief, fire marshal and superintendent of fire alarm telegraph, Howard L. Stanton; 4 captains, 4 drivers, 4 chauffeurs, one tillerman, 6 hose and laddermen and two substitutes in the permanent force—a crew of 22 men. In addition there is the call force composed of deputy chief Adam Gernhard, one captain, 2 engineers, 2 stokers, one assistant engineer, two drivers, 23 hose and laddermen, and a volunteer force of one engine company and one truck company, numbering forty men. This gives a total working force of 94 men.

The apparatus in service in the department includes one aerial truck, one city size truck, 2 metropolitan engines, one combination chemical automobile with 40-gallon tank, one double tank combination chemical and hose wagon with 25-gallon tanks, 2 combination chemical

and hose wagons with 25-gallon tanks, 2 hose wagons used as exercise and supply wagons, 2 exercise wagons, one buggy, one hand drawn hose cart and 19 three-gallon fire extinguishers.

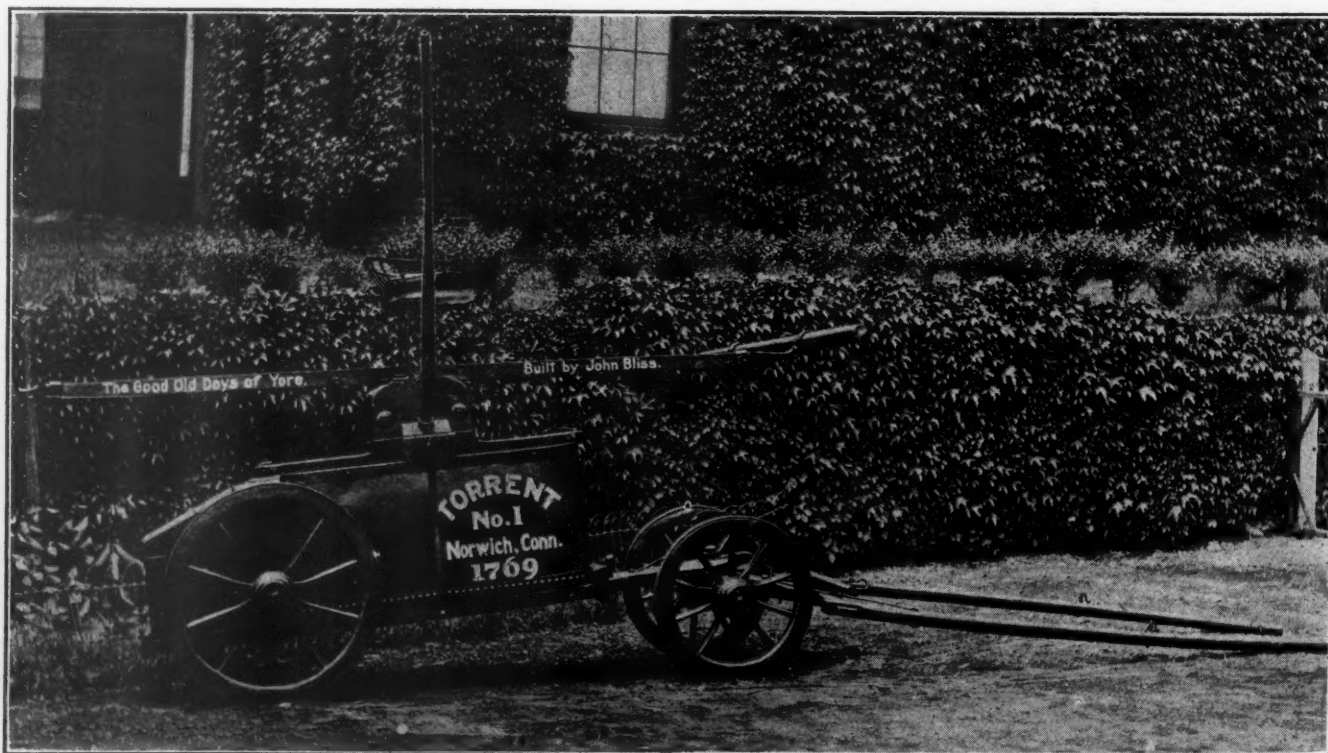
The number of feet of hose in the department in good condition is less than for several years, owing to a less amount purchased and to a large amount thrown out on account of failures. Engine Co. No. 1 has 1,800 ft. of 2½-inch and 800 ft. of 3-inch. Engine Co. No. 2 has 1,350 ft. of 2½-inch. Chemical Cos. No. 1, 2 and 3 have 4,950 ft. of 2½-inch hose. This gives a total of 8,900 feet, of which 5,300 feet is considered good hose and 3,600 feet as in fair condition and capable of standing any pressure to which it may be subjected. Hose that is five years old and less is carried as good; that over five years is classed as fair but is tested yearly and kept in service until it will not stand 150 pounds pressure.

One piece of motor apparatus has been used during the past year, and the small loss sustained by fire compared with the unusual number of alarms, is largely due to the quick response made by it. The record of service of this combination chemical for the year is:

Number of fire alarms responded to.....	203
Number of miles traveled to and from fires.....	356.9
Number of miles traveled demonstrating and testing .....	37.7
Number of feet of 2½-inch hose laid.....	12,950
Number of feet of 3-inch hose laid.....	1,350
Number of feet of ¾-inch chemical hose laid .....	7,400
Number of times 40-gallon chemical tank was discharged .....	37
Number of times the 3 gallon chemical tanks were discharged .....	134
Number of gallons of chemical water discharged .....	1,880

To render the above service it has cost for maintenance and upkeep:

197 gallons of gasoline .....	\$ 39.40
25 gallons of oil.....	12.50
Tire chains, lighting, batteries and spark plugs, etc .....	34.05
Tires, tubes and sundry repairs.....	109.34
Total.....	\$195.29



OLD NORWICH ENGINE, FIRST OWNED BY CITY, AND FIFTH IN THE UNITED STATES.



Eleven new hydrants were added to those already in service, making 421 public and 61 private hydrants subject to use in case of fire. Thirteen cisterns are distributed about the city, connected to the water mains by 4-inch and 6-inch pipes with gates near the cisterns. The pressure on the hydrants varies from 8 to 100 pounds, the average pressure in the business district being 85 pounds. The greatest height of buildings in the city is six stories and all these are built of brick or stone.

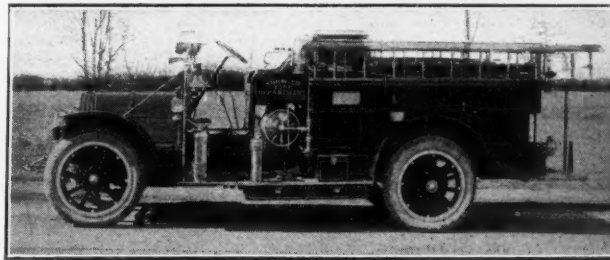
Buildings throughout the business district are regularly inspected by the uniformed force of the department and records kept of the same, in addition to the inspections made by the fire marshal. A new gasoline ordinance was approved and put in force during the past year to prevent the careless handling of combustibles. All permits to erect new buildings or alter old ones are received by the fire marshal and he also sees to the enforcement of state laws or local ordinances concerning buildings and fire prevention.

During the year ending June 31, there were 243 fires, of which 44 occurred in brick buildings, 37 of which were three stories high, 2 four stories high and 5 less than three stories; while 142 were in frame buildings, of which 42 were two stories, 37 two and a half stories, 23 one story, 22 one and a half stories, 16 three stories and 1 three and a half stories; 4 were in three-story brick and frame structures, 1 was in a one-story stone and frame and 1 in a one-story iron and frame structure. The remaining 51 were not in buildings. Of the total number, 71 fires were before noon and 152 fires between noon and midnight.

In extinguishing these 243 fires, 43,050 feet of 2½-inch and 3-inch hose were laid and 13,250 feet of chemical hose; 2,510 feet of ladders were raised; 3,000 gallons of chemical were used, 40-gallon extinguishers being discharged 37 times, 25-gallon extinguishers 27 times and 3-gallon extinguishers 282 times. The apparatus travelled 779½ miles and was 454 hours in service. The greatest

number of hours of service (71) occurred in February, the second largest number in January and the other months arranged according to the hours of service were as follows: June, August, July, April, March, May, November, October, December and September, the last named having but fourteen hours' service.

The expenses of the department for the year totaled \$31,998, of which \$2,000 was for salaries, \$22,089 for pay-rolls, \$2,713 for harness, shoeing, forage, etc., \$550 for hose, \$92 for new apparatus, \$308 for repairs to apparatus, \$1,287 for fuel, lighting, etc., \$192 for the fire alarm telegraph, \$448 for supplies and the remainder miscellaneous.



LATEST NORWICH APPARATUS—MOTOR COMBINATION.

The Pope-Hartford combination chemical and hose wagon, which was purchased in March, 1912, takes care of 75 per cent of all the fires in the city.

As compared to its latest apparatus, chief Howard L. Stanton has sent us a photograph of the fire apparatus owned by Norwich which was built in 1769, and is still preserved at the department headquarters. This machine was purchased by donations, the subscription list for which is still in existence and shows the money as subscribed in pounds and shillings. It was built by John Bliss, a descendant of whom is in business in Norwich. This engine is the fifth oldest fire engine made in the United States, the previous ones having been built in Philadelphia, Boston and New York.

## FIRE APPARATUS IN AMERICAN CITIES

Figures and Other Data Concerning More Than Seven Hundred Fire Departments, Furnished to Us by the Fire Chiefs—Amount of Each Kind of Apparatus in Service—Size of Force—Building Inspection

The tables in this issue give information concerning the fire apparatus in use and in reserve in about 750 cities, and also other information concerning department equipment and operations. Table No. 1 gives a list of horse-drawn apparatus, Table No. 2 motor apparatus and Table No. 4 hand-drawn apparatus; while Table No. 3 gives the number of fire houses, number of men on full time and serving as call men or as volunteers; statements as to whether the department has fire prevention squads, operates on two-platoon system, whether firemen make systematic inspection of buildings and whether the hose couplings will also fit those of neighboring cities.

In addition to the apparatus listed in the tables, the following are reported which it did not seem practicable to so list:

San Bernardino, Cal., has a hose wagon originally horse-drawn but used as a trailer. Daytona, Fla., has two chemicals, similarly drawn by motor apparatus. Beardstown, Ill., has three hand reels which are ordinarily coupled to a motor truck. Decatur, Ill., has two steam fire engines drawn by the auto apparatus. Minneapolis, Minn., has a steam fire engine with a short pole which is hauled by an auto combination. Bozeman, Mont., has provided a steamer and a hook and

ladder truck with special tongues to permit attaching them to motor apparatus. Lambertville, N. J., has a steamer which is attached as trailer to a gasoline combination. Salt Lake, Utah, has equipped two steam fire engines with drawbars for the same purpose. Suffolk, Va., has an engine, two hose reels and a truck which are used as trailers behind motor apparatus.

Denver, Colo., has a motor fire alarm car; West Haven, Conn., an electrician's repair car; Davenport, Ia., a fire alarm telegraph repair wagon; Louisville, Ky., autos for master mechanic and chief operator; Baltimore, Md., four horse-drawn linemen's wagons; Kansas City, Mo., an auto for the superintendent of fire alarm; Binghamton, N. Y., a fire alarm repair car; East Liverpool, O., a fire alarm car; Charleston, S. C., a fire alarm wagon. Baltimore, Md., has two horse-drawn construction trucks; Boston has six repair wagons, two supply wagons, three manure wagons and one caravan, all horse-drawn; Kansas City, Mo., has three supply wagons; Manchester, N. H., a horse-drawn repair wagon; Ithaca, N. Y., a horse-drawn fire patrol wagon; Yonkers, N. Y., a horse-drawn repair wagon; Fresno, Cal., has five motorcycles; Marshalltown, Ia., a motorcycle with pyrene; Schenectady, N. Y., a motorcycle; Hoquiam, Wash., a motorcycle.

(Continued on page 499.)

TABLE NO. 1.—HORSE-DRAWN APPARATUS

City.	Popu- lation.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
<b>Alabama:</b>											
Birmingham	160,000	4		2				1			
Florence	8,000			1							
Montgomery	40,000	4	1	2	6	1	1			2	1
Opelika	6,000					1					
Selma	20,000	1	1	2		1		1			1
Tuscaloosa	12,000					(1)					
<b>Arizona:</b>											
Douglas	12,000	1					1				
<b>Arkansas:</b>											
Little Rock	65,000	2 (1)		3		1	(1)			(1)	
Pine Bluff				3			1			1	
Texarkana	20,000						1				1
<b>California:</b>											
Alameda	28,000	1	1	3		2					
Alhambra	8,700										
Berkeley	52,000										1
Fresno	40,000	5		5 (1)				1		1	
Hanford	6,500	2		1		(1)	1				
Lodi	4,000			1							
Los Angeles		19 (3)	(2)			18 (4)	4		1	(5)	1
Merced	3,500	2		1	2						
Modesto	7,500			1							
Monterey				1							
Oakland	200,000	14 (3)	1	6 (3)		8	5			(3)	
Pasadena	42,000	1	3 (1)	1 (2)			(1)				
Petaluma	7,000			1							
Red Bluff	4,500	3			3						
Salinas	4,500	1									
San Rafael	6,000			1	5		2				
Santa Cruz				1	4		1				
Santa Rosa	10,000	1 (1)		1 (1)							
Stockton	30,000	1 (27)	1 (17)	1 (27)				1		17	
Visalia	6,000			1		1		1			
Woodland	6,000	2		1	1		1				
<b>Colorado:</b>											
Alamosa	6,000				2	1					
Boulder	11,000			1		(2)					
Colorado Springs	35,000	1		1	(2)		(1)	1		(1)	
Denver	213,380	9	(2)	14 (5)			2	4 (1)	(1)	(3)	
La Junta	7,000			1	1					1	
Longmont	6,000					(1)					
Pueblo	55,000										
Trinidad	14,000			1	3	1	1				
<b>Connecticut:</b>											
Ansonia	17,000					1	1				
Danbury	25,000			2				1			2
Danielson	3,500	1		1	3						
Middletown	12,000			1		1	1				
New Britain	53,000	3				1	1				2
New Canaan	4,000	1		1	1	3	1				
Norwich	30,000	2		1	1						
New Haven	150,000	10 (3)	1	4 (4)	1	3	3 (1)	1		1	8
Putnam	9,000			3	(2)		1				
So. Manchester				2	3	1	2				
Stamford	30,000	1 (1)				1	1	1		1	2
Stratford	7,000			1	1		1				
Wallingford	10,000	1			1		1				
Waterbury	91,000	2 (1)		2		2	1	1		1	2
West Haven	12,000			1							
Windsor Locks	3,800										
<b>Florida:</b>											
Gainesville	9,000			1 (1)	(1)		1				
Jacksonville	70,000	2		3		2	1				1
Key West	23,000	3 (1)					1				1
Lake City	7,000			1							
Miami	18,000	1					1				
St. Petersburg	10,000					(1)					
Tampa	60,000	3	1	3	1	2		1		2	2
<b>Georgia:</b>											
Albany	13,000	(1)		(1)							
Americus	10,000	1		2							
Athens	20,000						1			1	
Augusta	55,000	3	1	3		1	1	1		(1)	1
Brunswick	15,000	(1)					1			(1)	
Carrollton	5,000			2	1		1				
Cartersville	7,000		2			1	1		2		
Columbus		(2)	(1)	(2)		3	1			(2)	
Dawson	3,500	1		1 (1)			(1)				
Douglas	5,285				2						
Elberton	7,500			1			1				
Hawkinsville	5,000	(1)	(1)		(3)	(1)	(1)				
La Grange	10,000			1							
Quitman	5,000	1	1	1	1	1	1		1		
Savannah	90,000	(3)	(1)				4 (1)	2			2
<b>Idaho:</b>											
Idaho Falls	6,000					1 (1)					
<b>Illinois:</b>											
Aurora	40,000	1		1		2		1		1	3
Belleville	23,000	2			1	1	1			1	
Belvidere	7,500					2	1				1
Berwyn	7,000			1							
Bloomington	30,000	2		2			1			1	1
Canton	11,500		1	1		2	2				
Carmi	3,500				2						
Champaign	16,000	1	1	1	1		1		1		
Chicago		111 (21)	10	96 (22)	2		21 (3)	13 (2)	1	25 (5)	15
Chicago Heights	18,000	2		1		1	1 (1)				2
Cicero	30,000			5		1	1				1
Danville	32,000		1 (1)	5 (1)			1			1	
Decatur							1			1	
Dixon	10,000			1	3	1	1			1	
Edwardsville	8,000	1	1	1	1	1				1	
Galena	6,000				3	1	1				



TABLE NO. 1—HORSE-DRAWN APPARATUS.—Continued.

City.	Population.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
Geneva	4,000			1	1						
Harrisburg	10,000			1		1	1				
Highland Park	7,000			1							
Jacksonville	18,000	1 (1)			(1)	1	1				
Joliet	40,000	1	3	4				1			
Kewanee	16,000		1	1			1				3
Lincoln	11,000		1	1	(1)		1				
Macomb	7,000		3		1	1	1				1
Metropolis	5,000			1	1		1				
Mt. Vernon	12,000			(1)		1					
Oak Park	26,000			1 (1)		1			1		
Oglesby	3,500		1			1	1				
Olney	6,000			1			1				
Pekin	11,000	(1)		2	5		1				
Peoria	66,950	2 (1)	1	6 (1)	(2)	2	2	1		1	
Pontiac	7,000	1		2	2					2 (1)	1
Quincy	39,000	4 (1)	1		3 (1)	2		1			6
Sparta	3,000	1			1						
Sterling	8,000					(1)	(1)	(1)			
Streator	17,000			2	1					1	
Sycamore	4,500			3			1				
Urbana	10,000				1	1	1				
Waukegan	18,000			(1)		1	1				
Westville	5,000	1	2	1			1			1	
Woodstock	4,500			2	2	1	1				
<b>Indiana:</b>											
Alexandria	5,096		1	2			1				
Anderson	30,000			3		1	1			1	
Auburn	5,000			1		1					
Bloomington	10,000	1		1	1	1					
Columbia City	4,000	1 (1)		1	2 (2)		1				
Huntington	15,000	2				2	1				
Indianapolis	266,935	13	3	25			8	2	1		1
Kokomo	20,000					3	1			1	1
Lafayette	21,000	(1)	(1)	2	2		1			1	
Logansport		1	5	4		5	1			1	
Marion	24,000			3	1	2					
Martinsville	6,000			2			1				
Michigan City	21,000	1 (1)		2	(2)		1			1	
Mishawaka	13,000			1			1				
Montpelier	3,000			1	2		1				
Muncie	25,000	1				3		1			
North Vernon	4,000			1			1				
Plymouth	5,000			1		3	1				
Richmond	23,000					4	1				
Rochester	5,000			1	1	1			1		
Seymour	8,000	1			1	1	1				
South Bend	65,000		(1)	5 (1)			1 (1)				
Sullivan		1				1	1				
Terre Haute	60,000	3		(2)		8	2	1		2	2
Wabash	8,595			1	2	1	2				
Warsaw	5,500					1					
Whiting	7,000					1					
<b>Iowa:</b>											
Cedar Rapids	38,500			4		1	1				1
Davenport	50,000			5 (1)						1	
Des Moines	86,368		2	(3)		4	(2)				
Fairfield	6,000			1	1				2		
Iowa City	1,200			1			1			1	
Marshalltown	14,500					(1)					
Mason City	20,000					1	1				1
Sioux City		1	1	3		2	1			(1)	8
Washington	6,000			2			1			1	
Waterloo	30,000	1				2		1			
Webster City	6,000					1	1				
<b>Kansas:</b>											
Abilene	5,000					1					
Atchison	17,000	(2)		1	(1)			(1)		1	
Hutchinson	19,000						1				
Kansas City	90,000	2		1		3	1			2	1
Lawrence	14,000			2			1			1	1
Newton	9,000			(1)							
Olathe	3,700			1	2						
Parsons	19,000			2	2		1		1		
Salina	11,000			(1)							
Topeka	47,000	1 (1)	1 (1)	2	(2)	2					
Winfield	7,500		1			1					
<b>Kentucky:</b>											
Bowling Green	11,000			1		2	1			1	
Cynthiana	6,500			1	3		1				
Dayton	8,000	1	1	1			1				1
Henderson	12,000		1	2	1	1	1			1	1
Hopkinsville	1,200			2		1	1				
Lexington	40,000		(1)	1		3					1
Louisville	250,000	22		7	15	5	2	4	1	6	14
Morganfield				1	1	2	1		1		
Newport	31,350			2							
Paducah	30,000	1			1	4	1	1		1	1
Richmond	6,000			1							
Shelbyville		1		1							
<b>Louisiana:</b>											
Shreveport	40,000			1		2					
Thibodaux	4,000	1		3	1	2	1				
<b>Maine:</b>											
Auburn	16,000	1		3	(1)	(1)	1 (1)				
Biddeford	18,000	3		2	4	1	1			1	1
Bridgton	3,000	1	1	1							
Brunswick	7,500			4	5		1				
Buxton	4,000			4			1				
Eastport	5,000			2	3		1				
Ellsworth	3,500			3			1				
Fort Fairfield	2,000						1				
Gardiner	6,000	3		6	3		1				
Hallowell	3,000	1		1	4	6	1				
Hibiscus	3,363	1			4		1				
Hamford	8,000		(1)			1	1				
Sanford	10,600		3	4	3		3				1
Seowhegan	6,000	1		2	1		1				

TABLE NO. 1—HORSE-DRAWN APPARATUS.—Continued.

City.	Popu- lation.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
South Paris.....	2,000	.....	.....	.....	5	.....	1	.....	.....	.....	.....
Van Buren.....	4,000	.....	.....	1	4	.....	1	.....	.....	.....	.....
Winslow.....	2,500	.....	.....	1	1	.....	.....	.....	.....	.....	.....
<b>Maryland:</b>											
Baltimore.....	700,000	30 (8)	(1)	23 (21)	(11)	.....	7	7 (4)	2	12 (2)	9
Cumberland.....	26,000	.....	.....	.....	.....	3	.....	1	.....	.....	.....
Easton.....	3,600	1	.....	.....	5	.....	1	.....	.....	.....	.....
<b>Massachusetts:</b>											
Adams.....	15,000	.....	1	1	5	.....	2	.....	.....	.....	.....
Amherst.....	5,800	1	.....	4	2	.....	1	.....	.....	.....	.....
Arlington.....	13,000	.....	1	1	.....	.....	1	.....	.....	.....	2
Beverly.....	21,000	4	1	5	.....	1	2	.....	.....	1	3
Baldwinsville.....	5,000	2	.....	2	2	.....	.....	.....	.....	.....	.....
Boston.....	750,000	45 (7)	10 (6)	43 (5)	.....	1	18 (8)	5 (1)	3 (1)	16	41
Brockton.....	65,000	4 (1)	1 (2)	(2)	(2)	.....	1	1	1	.....	6
Brookline.....	30,000	2	1	1	.....	5	1	1	.....	1	2
Cambridge.....	110,000	6	2	7 (2)	.....	1	3	1	.....	(1)	7
Chelsea.....	40,000	3	.....	3	.....	.....	1	.....	.....	.....	3
Chicopee.....	25,401	1	.....	1	.....	.....	2	.....	.....	.....	2
Cohasset.....	2,500	.....	.....	2	1	1	2	.....	.....	.....	.....
Dedham.....	9,000	1	.....	1	.....	1	2	.....	.....	.....	.....
Easthampton.....	9,250	.....	.....	1	1	.....	1	.....	.....	.....	.....
Fitchburg.....	37,826	2	(1)	3 (2)	.....	2	2 (1)	1	.....	1	8
Foxborough.....	3,600	1	1	1	2	.....	1	.....	.....	.....	1
Framingham.....	15,000	3	.....	3 (3)	.....	.....	1	.....	.....	1	.....
Greenfield.....	13,000	.....	.....	1	1	2	1	.....	.....	.....	1
Haverhill.....	50,000	5	3	3 (3)	.....	.....	2	1	.....	.....	.....
Hingham.....	6,000	1	.....	2	.....	1	1	.....	.....	.....	.....
Lenox.....	3,500	1	.....	.....	2	.....	1	.....	1	.....	.....
Lowell.....	111,000	6	2	12	.....	.....	5	2	1	.....	13
Ludlow.....	5,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lynn.....	95,000	2 (4)	(1)	2 (6)	.....	.....	2	.....	.....	1 (1)	4
Malden.....	48,000	2 (1)	2	2 (1)	.....	4	2	.....	.....	.....	5
Manchester.....	2,500	1	(1)	1	1	.....	1	.....	.....	.....	.....
Mansfield.....	5,500	.....	.....	2	1	1	1	.....	.....	.....	.....
Marblehead.....	.....	2	.....	2	3	.....	1	.....	.....	.....	2
Maynard.....	6,500	.....	.....	(1)	.....	.....	(1)	.....	.....	.....	.....
Medfield.....	28,300	1	1	1	1	.....	1	.....	.....	.....	2
Medford.....	28,300	1	1	.....	.....	1	1	.....	.....	1	.....
New Bedford.....	110,000	4 (4)	.....	3	.....	1	1	3	.....	.....	6
Newton.....	43,000	2 (1)	(2)	5 (2)	.....	1	1	.....	.....	(2)	6
No. Easton.....	4,500	.....	1	1	1	.....	1	.....	.....	.....	.....
Provincetown.....	4,500	1	1	1	6	.....	1	.....	.....	.....	.....
Plymouth.....	14,000	4	3	2	1	1	2	.....	.....	.....	1
Reading.....	6,000	(1)	.....	2 (3)	.....	.....	1	.....	.....	.....	.....
Peabody.....	17,000	2	1	5	.....	2	1	.....	.....	1	2
Revere.....	31,000	1	.....	1	1	1	.....	.....	.....	.....	3
Rockland.....	7,000	1	.....	4 (2)	1	.....	1	.....	.....	.....	.....
Salem.....	50,000	4	.....	4	.....	1	1	1	.....	.....	4
Somerset.....	3,200	1	1	.....	1	.....	1	.....	.....	.....	.....
Somerville.....	85,000	5	.....	2	.....	3	2	.....	.....	2	4
So. Hadley.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Swampscott.....	7,500	1 (1)	1 (1)	.....	.....	.....	1	.....	.....	1	1
Taunton.....	35,000	3	.....	4	3	2	3	1	.....	.....	4
Wakefield.....	12,500	3 (1)	.....	1	.....	.....	(1)	.....	.....	.....	1
Walpole.....	5,000	.....	.....	3	(2)	.....	2	.....	.....	.....	.....
Waltham.....	30,000	2	(1)	2	.....	1	1	1	.....	(1)	3
Warren.....	4,600	2	.....	2	.....	.....	2	.....	.....	.....	.....
Watertown.....	14,500	1	.....	1 (1)	.....	1	(1)	.....	.....	1	1
Webster.....	12,000	1	.....	2	.....	.....	1	.....	.....	.....	.....
Wellesley.....	7,487	.....	.....	3	.....	.....	1	.....	.....	1	1
Westfield.....	.....	.....	1	2 (2)	.....	.....	1	.....	.....	.....	1
Winthrop.....	12,000	1	(1)	2	.....	.....	1	.....	.....	.....	.....
Worcester.....	170,000	8	1	13	.....	2	4	2	1	.....	2
<b>Michigan:</b>											
Alpena.....	15,000	2	.....	2	1	2	1	.....	.....	.....	2
Ann Arbor.....	20,000	1	1	3	.....	.....	1	.....	.....	1	1
Battle Creek.....	30,000	2	.....	.....	.....	4	.....	1	1	.....	4
Bay City.....	48,000	3	.....	9	.....	.....	2	.....	.....	.....	.....
Coldwater.....	6,045	1	.....	1	1	.....	1	.....	.....	.....	1
Detroit.....	653,000	26 (6)	.....	26 (10)	.....	26 (10)	9 (4)	6 (3)	1	(6)	7 (2)
Dowagiac.....	6,000	.....	.....	.....	4	1	.....	.....	.....	.....	.....
East Jordan.....	3,400	.....	1	1	1	1	.....	.....	.....	.....	.....
Escanaba.....	15,000	.....	.....	1	.....	1	1	.....	.....	.....	3
Flint.....	49,000	1	.....	1 (2)	.....	.....	1 (1)	.....	.....	.....	.....
Grand Haven.....	7,900	1	.....	2	.....	.....	1	.....	.....	.....	.....
Grand Rapids.....	.....	11	2	6	.....	.....	3	2	.....	.....	15
Hastings.....	4,500	.....	.....	1	1	.....	1	.....	.....	.....	1
Holland.....	11,000	.....	.....	2	.....	.....	.....	.....	.....	.....	2
Ionia.....	6,000	.....	.....	1	.....	.....	1	.....	.....	.....	1
Jackson.....	40,000	3	.....	.....	.....	3	.....	1	.....	.....	2
Lansing.....	43,000	.....	.....	.....	.....	.....	1	.....	.....	(1)	1
Lapeer.....	4,000	.....	.....	1	.....	.....	1	.....	.....	.....	.....
Marine City.....	3,770	.....	.....	.....	3	.....	1	.....	.....	.....	.....
Menominee.....	14,000	1	.....	3	(3)	.....	1	.....	.....	1	3
Monroe.....	9,000	1	.....	2	.....	.....	1	.....	.....	.....	.....
Mt. Clemens.....	9,000	.....	.....	1	1	1	1	.....	.....	.....	1
Mt. Pleasant.....	5,000	.....	.....	.....	(1)	1	1	.....	.....	.....	.....
Niles.....	6,000	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Otsego.....	3,000	.....	.....	1	2 (1)	.....	1	.....	.....	.....	.....
Owosso.....	10,000	1	.....	1	2	2	1	1	.....	.....	2
Petoskey.....	6,000	.....	.....	3	.....	1	.....	.....	.....	(1)	1
Pontiac.....	20,000	(2)	.....	.....	(1)	1	.....	1	.....	(1)	2
Red Jacket.....	5,000	1	.....	1	.....	.....	.....	.....	.....	.....	.....
St. Joseph.....	6,000	1	.....	1	1	.....	1	.....	.....	.....	.....
Traverse City.....	12,000	2	2	2	4	2	2	.....	.....	1	1
<b>Minnesota:</b>											
Albert Lea.....	11,000	.....	.....	1	.....	1	1	.....	.....	.....	2
Anoka.....	5,000	.....	1	1	.....	1	1	.....	.....	.....	.....
Austin.....	8,000	.....	.....	1	4	.....	2	.....	.....	.....	.....
Brainerd.....	10,000	.....	.....	2	3	.....	1	.....	.....	.....	.....
Cloquet.....	7,031	.....	(2)	2 (1)	1	.....	1	.....	.....	.....	.....
Crookston.....	8,000	.....	.....	2	.....	1	1	.....	.....	.....	.....
Duluth.....	80,000	4	1	3	.....	1	3	1	.....	.....	7
E. Grand Forks.....	3,200	1	1	2	1	.....	1	.....	.....	.....	.....
Faribault.....	10,200	.....	1	1	4	.....	1	.....	.....	.....	1
Minneapolis.....	346,000	26 (2)	1 (6)	8 (7)	.....	13	.....	11 (2)	1	.....	.....
New Ulm.....	6,000	(1)	.....	2	(1)	8	.....	2	.....	.....	.....
Owatonna.....	6,500	1	.....	2	.....	1	.....	.....	.....	.....	.....
Pipestone.....	3,000	.....	.....	.....	.....	.....	1	.....	.....	.....	.....



TABLE NO. 1—HORSE-DRAWN APPARATUS.—Continued.

City.	Population.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
Red Wing .....	10,000	1	.....	3	.....	.....	1	.....	.....	1	2
Rochester .....	9,000	.....	.....	2	.....	.....	1	.....	.....	1	1
St. Cloud .....	13,000	.....	.....	1	.....	.....	1	.....	.....	.....	.....
Stillwater .....	10,280	2 (1)	.....	1	1	.....	1	.....	.....	.....	1
Virginia .....	17,000	1	.....	2	1	.....	1	.....	.....	.....	1
Winona .....	25,000	2	1	(1)	.....	1	2	1	.....	1	1
<b>Mississippi:</b>											
Corinth .....	6,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greenville .....	12,500	.....	.....	(1)	.....	3	1	.....	.....	1	1
Hattiesburg .....	15,000	.....	.....	3	.....	3	.....	.....	.....	1	.....
Jackson .....	26,262	2	.....	1	.....	2	(1)	.....	.....	.....	1
Vicksburg .....	25,000	2	.....	2	2	3	1	.....	.....	2	.....
Meridian .....	26,000	(3)	.....	3	.....	(1)	.....	1	.....	(1)	.....
<b>Missouri:</b>											
Carthage .....	10,000	.....	.....	1 (1)	.....	.....	1	.....	.....	1	.....
Clinton .....	6,000	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Fulton .....	6,000	.....	.....	1	1	1	.....	.....	.....	.....	.....
Kansas City .....	248,381	10 (2)	(1)	18	4 (2)	3	6 (1)	2 (1)	2	1 (3)	1
Macon .....	4,000	1	.....	1	1	.....	.....	.....	.....	.....	.....
Moberly .....	13,000	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Poplar Bluff .....	12,000	.....	.....	1	.....	.....	.....	.....	.....	1	.....
Rich Hill .....	2,800	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Sedalia .....	20,000	1	.....	2	1	.....	.....	.....	.....	.....	.....
<b>Montana:</b>											
Billings .....	16,000	.....	.....	1	1	.....	1	.....	.....	.....	1
Butte .....	.....	.....	(1)	2 (2)	(1)	(1)	(2)	.....	.....	1	.....
Great Falls .....	.....	.....	.....	2	.....	1	.....	.....	.....	.....	.....
Miles City .....	7,000	.....	.....	.....	(1)	1	.....	.....	.....	.....	.....
<b>Nebraska:</b>											
Columbus .....	6,000	.....	.....	.....	2 (1)	.....	1	.....	.....	.....	.....
Grand Island .....	12,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kalispell .....	5,500	.....	.....	.....	2	1	.....	.....	.....	.....	.....
Lewiston .....	6,000	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Missoula .....	16,000	1	.....	1	.....	.....	1	.....	.....	.....	1
Nebraska City .....	6,488	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Omaha .....	126,000	4 (1)	(2)	11 (2)	.....	1	4 (1)	1 (1)	1	2 (1)	.....
So. Omaha .....	.....	1	.....	5	.....	1	1	.....	.....	1	5
<b>New Hampshire:</b>											
Concord .....	21,497	4	(1)	6	(1)	.....	1 (1)	.....	.....	1	3
Franklin .....	7,000	1	.....	2	4	.....	1	.....	.....	.....	.....
Littleton .....	5,000	.....	1	1	1	1	.....	1	.....	.....	.....
Manchester .....	75,000	7	1	9	.....	2	3	1	.....	1	9
Nashua .....	28,000	4	.....	4	.....	1	2	.....	.....	2	4
Newport .....	4,000	1	.....	1	3	.....	1	.....	.....	.....	.....
Rochester .....	8,886	.....	.....	3	.....	.....	1 (1)	.....	.....	.....	.....
Suncook .....	3,300	.....	1	.....	2	.....	1	.....	.....	.....	.....
<b>New Jersey:</b>											
Asbury Park .....	10,500	3	(1)	2 (1)	.....	.....	1	1	.....	.....	1
Atlantic City .....	52,000	11 (3)	1	.....	1	8 (1)	1	4 (1)	.....	3	8
Camden .....	100,000	9	10	10	.....	6	2	1	.....	.....	3
Collingswood .....	6,000	1	.....	1	2	.....	1	.....	.....	.....	.....
East Orange .....	38,000	.....	.....	.....	3	4	1	1	.....	1	5
Freehold .....	4,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Glen Ridge .....	4,000	.....	.....	1	.....	.....	1	.....	.....	.....	.....
Hackensack .....	16,000	1	.....	2	.....	2	1	.....	.....	.....	.....
Hammonton .....	6,500	.....	2	1	2	.....	2	.....	.....	.....	.....
Lambertville .....	5,000	2	.....	1	1	3	1	.....	.....	.....	.....
Long Branch .....	17,000	3	1	5	.....	1	2	.....	.....	.....	.....
Madison .....	5,000	.....	.....	1	.....	.....	1	.....	.....	.....	.....
Morristown .....	13,000	.....	.....	.....	(1)	.....	(1)	.....	.....	.....	.....
Nutley .....	6,500	.....	.....	2	2	.....	1	.....	.....	.....	.....
Paterson .....	135,000	4	.....	4	4	.....	2	1	.....	.....	1
Phillipburg .....	17,500	1	1	5	5	1	1	.....	.....	.....	.....
Plainfield .....	25,000	1	.....	2	.....	2	1	1	.....	.....	2
Ridgewood .....	7,000	.....	1	2	.....	1	1	.....	1	.....	.....
Rutherford .....	10,000	.....	.....	2	.....	.....	1	.....	.....	.....	.....
Salem .....	8,000	1	1	.....	2	.....	1	.....	.....	.....	.....
Summit .....	10,000	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Westfield .....	8,000	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
West Hoboken .....	42,000	1	.....	1	.....	1	2	1	.....	.....	.....
Wharton .....	3,000	.....	1	.....	.....	.....	1	.....	.....	.....	.....
<b>New York:</b>											
Albany .....	108,000	11 (1)	.....	(2)	.....	11	1	3	.....	3	14
Albion .....	6,000	1	.....	.....	2	1	1	.....	.....	.....	1
Amsterdam .....	35,000	1	.....	.....	3	4	1	.....	.....	1	2
Auburn .....	35,000	(2)	.....	2	.....	2 (1)	1	1	.....	.....	3
Babylon .....	3,000	1	.....	3	.....	1	1	.....	.....	.....	.....
Ballston Spa .....	4,500	.....	.....	1	4	.....	1	.....	.....	.....	.....
Binghamton .....	50,000	3	.....	1	.....	.....	1	.....	.....	2	3
Cohoes .....	24,709	3 (2)	.....	.....	.....	4	.....	1 (1)	.....	1	4
Corning .....	15,000	.....	.....	2	3	1	2	.....	.....	.....	1
Eastchester .....	10,000	1	.....	3	5	1	.....	.....	.....	.....	.....
Elmira .....	40,000	6	.....	.....	.....	3	1	1	.....	.....	5
Elmira Heights .....	3,000	.....	1	1	.....	.....	.....	.....	.....	.....	.....
Fulton .....	12,500	2	.....	2	1	.....	1	.....	.....	.....	2
Hoversville .....	22,000	.....	.....	1	.....	2	1	1	.....	.....	.....
Hushen .....	3,500	.....	.....	2	.....	1	.....	.....	.....	.....	.....
Jornell .....	15,000	.....	.....	2	.....	1	.....	1	.....	1	1
Lehaca .....	14,900	2	.....	.....	.....	3	1	1	.....	1	1
Lamestown .....	35,000	2	.....	1	1	2	1	1	.....	1	5
Johnstown .....	12,000	.....	.....	1	.....	.....	1	.....	.....	.....	.....
Lockport .....	18,000	.....	.....	1	.....	2	.....	1	.....	.....	.....
Lawville .....	3,800	.....	.....	1	.....	.....	1	.....	.....	.....	.....
Malone .....	8,000	1	1	2	1	.....	1	.....	.....	.....	.....
Middletown .....	18,000	1	.....	.....	.....	1	2	.....	.....	.....	.....
New Rochelle .....	32,000	1	.....	.....	.....	4	1	.....	.....	.....	1
New York .....	5,350,000	176	1	203	.....	.....	104	2	60	30	.....
North Tarrytown .....	5,600	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Norwich .....	9,000	2	.....	.....	.....	3	1	1	.....	.....	.....
Oakland .....	18,000	2	.....	.....	.....	.....	1	.....	.....	.....	.....
Oswego .....	9,300	1	.....	.....	.....	2	1	.....	.....	.....	1
Ossining .....	13,000	1	.....	3	3	1	1	1	.....	.....	.....
Oswego .....	25,000	3 (1)	2 (1)	5 (2)	.....	1	2	1	.....	1	3

TABLE NO. 1—HORSE-DRAWN APPARATUS.—Continued.

City.	Popu- lation.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
Patchogue .....	8,000	1		1	2	1					
Peekskill .....	16,000			(1)		1 (1)	1				
Penn Yan .....	5,000	1									
Poughkeepsie .....	30,000	1		1		6	1				
Rensselaer .....	12,000					4	1				5
Rome .....	25,000	2 (1)		1		2		1	1	1	3
Schenectady .....	90,000	4				6	2	1	2		4
Southampton .....	2,500			(1)			(1)				
Suffern .....	3,000			1	4		1				
Syracuse .....	10,000			1		5		3 (1)	1	4	14
Tarrytown .....	15,000			1	2	2					
Tonawanda .....	12,000	1		3	1	3	3	1			1
Tupper Lake .....	4,000						1				
Utica .....	74,419	6	1	3		5	3	2		2	9
Waterloo .....	4,500	1			6		1				
Westfield .....	4,500		1	2	1 (2)		1				1
White Plains .....	20,000			3 (1)	2	1	1	1			
Yonkers .....	92,000					3	2				
<b>North Carolina:</b>											
Burlington .....	6,000			3	2				1	1	
Charlotte .....	45,000	(1)				2 (1)	1			1	
Elizabeth City .....	10,500	2		2	(1)		1	1			
Greensboro .....	20,000	3		2	1	2	1	1			1
Henderson .....	8,000			1		1	1				
<b>North Dakota:</b>											
Valley City .....	5,500			1 (1)							
<b>Ohio:</b>											
Ashland .....	9,000	1		1		1	1				
Barnesville .....	5,000	1									
Bellaire .....	15,000		1			1	1 (1)			1	
Bellefontaine .....	9,000			3			1				
Bellevue .....	5,500	1		1	1						
Bryan .....	4,641	1		1	1	1		1			1
Byesville .....	3,157	1	1	1							
Celina .....	4,500			1							
Chillicothe .....	15,000		1	1		2					
Circleville .....	7,000			1			(1)				(1)
Cleveland Heights .....	4,000			1	4		1				1
Columbus .....	210,000	18		3		11	4	3	1		5
Conneaut .....	12,000		1	1	2	1	1				
Coshocton .....	11,000				2	1	1				
Cuyahoga Falls .....	5,000					1	1				
Defiance .....	8,000	1	1	1	2		1				1
Delphos .....	5,000	2		2	1	1	1		1		
East Cleveland .....	17,000	1					1				
Eaton .....	4,500	1		1	1		1				
Elyria .....	18,000	1				1					2
Findlay .....	14,853	1	1	2	2		1			1	1
Gallion .....	8,500	1	1	3	1	1	1			1	
Girard .....	5,000		1	1			1				
Hamilton .....	35,279	1		5		14		1		2	
Jackson .....	6,000	1		1	1						
Lancaster .....	16,000			2							
Lebanon .....	3,200			1							
Lima .....	40,000	2		2 (1)	(1)	2	(1)	1		1	
Lorain .....	40,000			1		4					2
Mansfield .....	20,678	(1)	(1)	1		1	1			1	
Marietta .....	16,000	3 (2)	1	(2)				1			1
Marion .....	20,000			2	1		1			1	
Middletown .....	17,000			2			1				
Mt. Vernon .....	10,000			2			1				
Napoleon .....	4,900	1		1	1	1	1				
Nelsonville .....	6,500			1	1	1	1				
Newark .....	25,404		4		1	3	1				
Niles .....	9,000				1	1					
Norwood .....	20,000			(1)							
Oberlin .....	5,000		1	1		1	1				
Portsmouth .....	30,000	2			2		1			1	
Ravenna .....	6,000					1	1				1
St. Bernard .....	5,600					1	1				
St. Marys .....	6,000			1	1		1				
Salem .....	10,000					1					
Springfield .....	60,000	4	1	2		2	2	1		1	1
Steubenville .....	26,000					1	1				
Tiffin .....	14,000	1			1	1	1			1	
Toledo .....	200,000	11				17	6	(1)	1		17
Troy .....	7,000					1	1				
Warren .....	16,000			2	3		1				
Wellsville .....	9,000			1	1		1				
Wooster .....	8,000	1									
<b>Oklahoma:</b>											
Bartlesville .....	15,000	1		1	1			1			
Clinton .....	3,500			1	2		1				
Durant .....	8,000			1			1				
Enid .....	14,000	1				1		1			
Lawton .....	10,000					1					
McAlister .....	15,000		1	2			1			1	
Mangum .....	5,000			1	1						
Muskogee .....	32,000	3	1	2		1	1	1			
Oklahoma City .....	64,205	3 (2)				6	2 (1)	1	(1)	(2)	1
Okmulgee .....	12,000	1		1		1 (2)	1				
<b>Oregon:</b>											
Astoria .....	12,000	(2)		(1)		(1)		1		1	1
Baker .....	8,000					1	1				
<b>Pennsylvania:</b>											
Altoona .....	52,127	5		6	(1)	2	1	1		1	1
Ashley .....	6,500	1									
Beaver .....	3,500						1				
Berwick .....	20,000		1		1						
Bristol .....	10,000	1		1			1				
Brookville .....	4,000						1				
Eutaw .....	25,000					1	1				
Carbondale .....	20,000			2	(1)	1					
Carlisle .....	12,000	2			1	1		1			
Catasauqua .....	5,250	2			5		1				



TABLE NO. 1—HORSE-DRAWN APPARATUS.—Continued.

City.	Popu- lation.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
Chambersburg	13,000	2	1	3							
Clearfield	8,500	1	2				1				
Coatesville	15,000	2		(1)		2	(1)				
Connellsville	12,845				5	2					
Coplay	2,000		1		1						
Derry	3,000		1	1	1	1	1				
Easton	28,524	4	1	1	3	3	2	1		1	5
E. Stroudsburg	8,000			1	1	1	1				
Elizabethtown	2,800	1			3		1				
Ellwood City	4,000						1				
Erie	85,000	10	1	11		2		2		2	9
Farrell	15,000			1			1				1
Franklin	10,000			(2)			(1)				
Freedom	3,500			1							
Gallitzin	3,500				2	1					
Girardville	6,000				4		1				
Harrisburg	70,000	7		2	1	10	3	2		1	2
Holidaysburg	5,000	1		1	1						
Honesdale	3,000	2		2	4		1				
Jersey Shore	8,000			1	1		1				
Johnstown	65,900	5 (2)		2 (3)		5	1	1		(1)	(3)
Lansdowne	5,600					1	1				
Larksville	9,500		1		4	1					1
Latrobe	8,777										
Lehighton	6,500	1	1		5		1				
McKeesport	43,369			4		1					
Mauch Chunk	5,000	3	1	3	1		2	1		1	
Meadeville	16,000						(1)	(1)			
Miners' Mills	3,500			1	1		1				
Monongahela	10,000			1	3		1			1	
New Brighton	9,500			2			1				
New Castle	42,000						(4)	(2)	(1)		
Nifflin	9,000	2									
Norristown	30,000	3	1	1		2	1				
Northampton	9,000			1		1					
Oil City	19,000	1		3	2 (1)		1				
Phillipsburg	4,200	2	2		5		1				
Pittsburgh	565,000	45	2 (2)	1	21	16	21	10	1	10	8
Portage	500			1	1		1				
Funxsutawney	10,000			1	1		1	1			
Quakertown	5,000				3		1				
Reading	100,000	10	2	10		11		2		1	13
Ridgway	5,585			2	2 (1)		1				
Sayre	7,200						1				
St. Claire	7,000	1	2			2	1				
Scranton	140,000	7	(1)	6	1	8		1		2	4
Sharon	16,000			2			1			1	
Shenandoah	29,000	2		1	1	2	1				
So. Bethlehem	22,000	1		2	1	1		1			
So. Fork	6,000			1	1		1				
Steelton	15,000	1		1	2	2	2				
Sunbury	16,000	2		6		1				1	2
Turtle Creek	8,700			1	2		1				
Tyrone	8,000	2	1	1	1	1	1				
Vandegrift	4,500						1				
Warren	14,000	1		1		1	1				
Washington	17,000			1							
Waynesboro	9,000	2		1	1	1	1	1	1		
Weatherly	2,500	1		1	1		1				
West Chester	11,000					1					1
West Newton	3,000				3	1	1				
Wilkes-Barre	75,000	7 (1)	1			5	1	2		1	
Williamsport	34,000	5			3	2		1		1	5
Windber	10,000	1		1	1		1				
<b>Rhode Island:</b>											
Providence	224,336	14 (3)		4 (4)		10	10 (1)	4 (1)	(1)		23
So. Kingston	5,000	1		1	2		2				
Westerly	8,500	2			4		1				
<b>South Carolina:</b>											
Aiken	4,500	1			3		1				
Charlestown	59,000	6 (3)	(1)	3 (4)		2	1	1	1		2
Darlington	5,000	1	1	2	3	1	1		1		1
Marion	5,000			(2)							
Orangeburg	8,000			(2)			(1)				
Rock Hill	10,000			1	2						
Spartanburg	18,000	2 (1)		1 (1)	1	1 (1)	1				
Sumter	12,000	1		1		1					
<b>South Dakota:</b>											
Aberdeen	13,000	1				2					2
Mitchell	8,000				3	1					
Watertown	11,000		2			1	1			1	
<b>Tennessee:</b>											
Chattanooga	75,000	6		1		4		1			2
Columbia	10,000			(1)	(3)	(1)					
Knoxville	40,000	5	1	1	2	4		1	1	1	1
Park City	8,500				1						
Pulaski	5,150						1				
Tullahoma				1							
Union City	7,000			1							
<b>Texas:</b>											
Austin	44,000	(1)		6	(1)		1			1	
Beaumont	30,000	3 (1)	1	3		2	1	1		1	1
Bowle	3,500			2	1	1					
Bryan	5,000			1							
Corsicana	15,000	1		2	(2)	1	1	1			
Dallas	120,000	8	2	4	3	4	3	1		3	2
Dublin	3,000				2	1	1		1		
El Paso	60,000	1				3 (2)	1	1	1		1
Fort Worth	95,000	3	(1)	7 (1)		2	2	1		2	1
Gainesville	12,000			3			1		1		
Galveston	48,000	4	1	8			3	1		2	
Greenville	15,000	1		1		2	1			1	
Hillsboro	95,000	1		1	1		1				
Houston	125,000	9	1	9	1		2	1	1	2	2
Laredo	20,000	1	1	1	3						
McKinney	6,000	1		2							
Marlin	5,000		1	1			1				

TABLE NO. 1—HORSE-DRAWN APPARATUS.—Continued.

City.	Population.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
Mexia .....	4,500	.....	.....	.....	2	1	1	.....	1	.....	.....
Paris .....	18,000	1	.....	1	1	.....	1	.....	1	.....	.....
San Antonio .....	125,000	6	.....	5	.....	7	.....	2	.....	2	1
San Marcos .....	6,000	.....	.....	1	.....	1	.....	.....	.....	.....	.....
Sulphur Springs .....	8,000	.....	3	2	1	1	2	.....	.....	.....	.....
Sweetwater .....	6,000	.....	1	1	1	1	.....	.....	.....	.....	.....
Tyler .....	14,000	.....	1	1	.....	1	1	.....	.....	.....	.....
Victoria .....	.....	.....	1	3	.....	1	.....	.....	.....	.....	.....
<b>Utah:</b>											
Logan .....	9,000	.....	(2)	(2)	(1)	.....	.....	.....	.....	.....	.....
Salt Lake City .....	100,000	3	(1)	.....	1	6 (2)	3	.....	.....	(2)	2
Spanish Fork .....	4,500	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Springville .....	5,000	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
<b>Vermont:</b>											
Brattleboro .....	10,000	(3)	.....	2	3	.....	1	.....	.....	.....	.....
Middlebury .....	2,000	1	1	.....	3	.....	1	.....	.....	.....	.....
Montpelier .....	8,000	.....	.....	3	2	.....	1	.....	.....	.....	.....
Rutland .....	14,500	2	.....	2	.....	.....	.....	1	.....	.....	1
St. Albans .....	6,500	.....	.....	2	.....	.....	1	.....	.....	1	.....
<b>Virginia:</b>											
Alexandria .....	16,000	3 (1)	.....	2	1	.....	1	.....	.....	1	3
Charlottesville .....	10,000	1	.....	.....	1	.....	1	.....	.....	1	1
Danville .....	25,000	2	.....	1	.....	1	.....	1	.....	.....	2
Farmville .....	5,000	.....	1	1	.....	.....	.....	.....	.....	.....	.....
Harrisburg .....	5,000	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk .....	83,000	6 (3)	2	.....	.....	6	2	2	.....	3	2
Petersburg .....	25,000	3	.....	3 (1)	.....	2	1	1	.....	1	1
Portsmouth .....	37,000	3	.....	.....	.....	5	.....	1	.....	.....	.....
Richmond .....	140,000	11	.....	1	.....	11	1 (1)	4	.....	(3)	7
Roanoke .....	53,000	3	.....	.....	.....	4	.....	1	.....	1	.....
Staunton .....	11,000	.....	.....	1	.....	(1)	.....	.....	.....	.....	.....
<b>Washington:</b>											
Anacortes .....	7,000	.....	(1)	(1)	.....	.....	.....	.....	.....	.....	.....
Bellingham .....	30,000	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Centralia .....	11,500	(1)	.....	.....	.....	1	.....	.....	.....	.....	.....
Colfax .....	3,500	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Ellensburg .....	6,000	1	.....	.....	1	.....	1	.....	.....	.....	1
Everett .....	33,000	1	.....	.....	2	.....	1	.....	.....	.....	.....
Hoquiam .....	12,000	.....	.....	.....	.....	2 (1)	.....	.....	.....	.....	.....
Olympia .....	9,000	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Port Townsend .....	5,200	1	.....	1	4	.....	1	.....	.....	.....	.....
Pullman .....	2,000	1	.....	.....	5	.....	1	.....	.....	.....	.....
Snohomish .....	4,500	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Spokane .....	125,000	3	.....	1	.....	5	2	.....	.....	.....	1
Tacoma .....	103,000	8 (1)	1 (2)	9 (1)	9 (1)	(1)	.....	(1)	.....	(2)	2
Vancouver .....	12,000	1	1	1	3	1	.....	.....	.....	.....	.....
<b>West Virginia:</b>											
Benwood .....	6,500	.....	2	1	1	1	.....	.....	.....	.....	1
Charleston .....	25,000	2	.....	3 (2)	.....	.....	(1)	1	.....	(1)	1
Charles Town .....	3,500	2	.....	.....	5	.....	1	.....	1	.....	.....
Elkins .....	8,000	.....	1	1	2	1	1	.....	.....	.....	.....
Fairmont .....	18,000	.....	.....	2	2	2	1	.....	.....	1	.....
Keyser .....	6,000	.....	.....	.....	2	.....	1	.....	.....	.....	.....
McMechen .....	1,400	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Mannington .....	2,700	.....	.....	.....	4	.....	1	.....	.....	.....	.....
Martinsburg .....	12,000	.....	.....	1	.....	1	.....	.....	.....	.....	.....
Princeton .....	7,000	.....	.....	.....	3	.....	1	.....	.....	.....	.....
Wheeling .....	42,000	5 (1)	.....	.....	.....	6	1	1	.....	1	5
<b>Wisconsin:</b>											
Appleton .....	17,000	1	.....	3	.....	3	1	.....	.....	(1)	1
Ashland .....	13,000	.....	.....	2	1	1	1	.....	.....	1	.....
Baraboo .....	6,300	.....	.....	.....	.....	1	1	.....	.....	.....	.....
Beaver Dam .....	7,000	.....	.....	1 (1)	1	.....	1	.....	.....	.....	.....
Berlin .....	5,000	1	.....	2	.....	3	1	.....	.....	.....	1
Chippewa Falls .....	9,000	.....	1	2	1	.....	1	.....	.....	.....	1
Cudahy .....	4,500	.....	1	1	1	1	.....	.....	.....	.....	2
Eau Claire .....	20,000	(1)	.....	3 (1)	.....	.....	1	.....	.....	.....	.....
Hartford .....	3,085	1	.....	1	2	.....	1	.....	1	.....	.....
Hudson .....	3,250	.....	.....	.....	1	.....	1	.....	.....	.....	.....
Janesville .....	14,000	2	.....	3	.....	.....	1	1	.....	.....	1
La Crosse .....	35,000	3	.....	6	1	1	2	.....	.....	2	5
Lake Geneva .....	3,400	.....	.....	1	1 (1)	1	1	.....	.....	.....	.....
Manitowac .....	15,000	2	1	3	.....	.....	1	.....	.....	1	1
Menasha .....	7,000	1	.....	2	.....	.....	1	.....	.....	.....	.....
Menominee .....	5,200	.....	.....	2	.....	2	.....	.....	.....	.....	.....
Merrill .....	9,000	.....	.....	(1)	1	.....	(1)	.....	.....	.....	.....
Milwaukee .....	410,000	27 (3)	4 (3)	18 (5)	.....	10	5 (2)	2 (1)	1	5	30
Neenah .....	6,500	1	.....	6	.....	.....	1	.....	.....	.....	.....
Oshkosh .....	33,062	2	.....	1	4	.....	1	1	.....	.....	7
Plymouth .....	3,500	1	1	1	.....	.....	1	.....	.....	.....	.....
Portage .....	5,500	1	.....	1	2	1	1	.....	.....	.....	1
Pt. Washington .....	3,700	1	.....	1	(2)	.....	1	.....	1	.....	.....
Racine .....	45,000	(2)	.....	.....	.....	2 (1)	2	.....	.....	.....	3
Reedsburg .....	2,800	.....	.....	1	.....	1	1	.....	.....	.....	.....
Rhineland .....	6,500	.....	.....	1	.....	1	1	.....	.....	.....	2
Rice Lake .....	5,000	1	.....	1	4	.....	1	.....	.....	.....	.....
Ripon .....	4,000	.....	1	1	.....	.....	1	.....	.....	.....	.....
Stevens Point .....	10,000	(1)	.....	2	.....	.....	1	.....	.....	.....	3
Stoughton .....	5,000	.....	.....	.....	1	.....	1	.....	.....	.....	.....
Sturgeon Bay .....	5,000	2	1	3	.....	1	1	.....	.....	.....	1
Superior .....	46,000	2 (1)	.....	1	.....	4	1	.....	.....	.....	6
Two Rivers .....	5,300	1	1	1	.....	.....	1	.....	.....	.....	.....
Waupaca .....	3,000	1	.....	1	2	.....	1	.....	.....	.....	.....
Wausau .....	18,000	2	.....	1	.....	3	1	.....	.....	1	4
<b>Wyoming:</b>											
Cheyenne .....	17,060	.....	.....	2 (1)	.....	1	.....	1	.....	(1)	.....
Lauder .....	1,810	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
<b>Canada:</b>											
Brantford, Ont. ....	25,000	.....	.....	3	1	.....	2	1	.....	1	1
Hamilton, Ont. ....	100,808	2	.....	3	.....	4	3	.....	.....	1	1
Kingston, Ont. ....	21,000	2 (1)	.....	2 (2)	.....	(1)	2 (1)	.....	.....	1	2
Lethbridge, Alta. ....	12,000	1	2	1	.....	.....	1	.....	.....	.....	1
London, Ont. ....	56,358	1	(1)	2 (1)	(1)	4	1 (1)	1	.....	1	1



TABLE NO. 1—HORSE-DRAWN APPARATUS.—Continued.

City.	Population.	Pump- ing engines.	Chem- ical engines.	Hose wagons.	Hose reels.	Chemical and hose.	Ladder trucks.	Aerial trucks.	Water towers.	Chief's buggies.	Exercise or fuel wagons.
Peterborough, Ont.....	25,000	1	.....	2	.....	.....	1	.....	.....	1	1
St. Catherine's, Ont.....	17,000	1	.....	2	1	.....	1	.....	.....	1	1
Sault Ste Marie, Ont.....	15,000	1	.....	1	.....	.....	.....	.....	.....	.....	2
Stratford, Ont.....	18,000	1 (1)	.....	1	1	.....	1 (1)	.....	.....	.....	.....
Victoria, B. C.....	60,000	2	.....	1	.....	3	.....	1	.....	.....	2
Vancouver, B. C.....	140,000	5	2	4	.....	1	1	1	.....	.....	4
Windsor, Ont.....	25,000	.....	.....	3	.....	1	1	1	.....	.....	2
Winnipeg, Man.....	210,000	7	6	17	.....	.....	9	3	1	1	8

## FIRE APPARATUS IN AMERICAN CITIES.

(Continued from page 491.)

Bloomington, Ind., has a combination motor truck, hose and chemical, as has also South Bend; Davenport, Ia., has a combination aerial truck and hose; Walpole, Mass., has three horse-drawn forest fire wagons, and Cohasset, Mass., has one of these. Kansas City, Mo., has a high-pressure wagon, also buggies for veterinary and fire warden. Schenectady, N. Y., has two horse-drawn gasoline pumping engines; Oklahoma City, Okla., has a turret wagon. New Castle, Pa., has two auto trucks combined with hose and chemical. Vancouver, B. C., has a self-propelled fire engine.

Baltimore, Md., has two fire boats; Detroit, Mich., two; Menominee, Mich., one; Milwaukee, Wis., four.

Boston, Mass., has forty-nine sleighs; Wellesley, Mass., three; Anoka, Minn., one; Virginia, Minn., one; Malone, N. Y., one; Oneida, N. Y., two; Oswego, N. Y., seven; Syracuse, N. Y., ten exercising sleighs; Brantford, Ont., has a number of sleighs, as has also Kingston, Ont., the latter also having sleigh runners for all apparatus; and London, Ont., has six sets of sleighs. Mansfield, O., has an engine for thawing out frozen hydrants. Quakertown, Pa., and Norwich, Conn., have old-fashioned hand pumping engines. Calgary, Alta., has a fire alarm buggy.

The question was asked, "Are you buying any more horse-drawn apparatus?" and 554 replies were received. Of these 549 replied in the negative, and only 5 stated that they were continuing to buy horse-drawn apparatus. It is interesting to note, on the other hand, that hand-drawn apparatus has by no means entirely disappeared, there being about 225 cities, or about 30 per cent, which report still using such apparatus or at least keeping it in reserve, while a number of them have no other apparatus in service.

Another question asked was, "Have you arrangements with nearby cities for mutual aid?" 418 replying that they did have such arrangements and 227 that they did not. Several gave reasons why such arrangements were not practicable, the more common one being that there were no nearby cities. For instance, Miami, Fla., reports that the nearest city is 366 miles away. Nephi, Utah, has no city nearer than 11 miles; Provincetown, Mass., has no neighbor nearer than 75 miles. Probably in the majority of cases there is no written agreement drawn up, but a general understanding that if help is called for it will be sent. Aiken, S. C., reports having had help from Augusta, Ga. Albion, N. Y., has gone as far as fifteen miles to answer calls for help and saved considerable property by doing so. Jackson, Miss., has responded with aid to several nearby towns, but has never had to call for help itself. Many instances of such aid have been reported in our news columns, and scores will probably be recalled by any fire chief.

More important than arrangements for mutual aid is the possibility of giving aid when called upon, which often is found very difficult when the hose couplings are different. Four hundred and eighty-six towns replied that their couplings fit those of all nearby cities, 36 that their couplings fit in some of the nearby cities,

145 that their couplings did not fit the others and 22 reported that they did not know whether or not their couplings were the same, while 50 did not report at all. Quite a number stated that while their couplings were not the same, they carried adjusters which enabled them to connect with any of the neighboring cities.

Inquiry was made as to whether the firemen inspect all buildings in the city systematically, and 458 replied that this was done. A number stated that inspection was made by the chief when he thought it necessary, while in many others the inspection was made by the fire marshal, or from time to time by firemen under the direction of the fire marshal. It is encouraging to find that more or less thorough building inspection of some kind is becoming quite prevalent throughout the country.

While much has been said about the two-platoon system, it does not appear to have made much headway, only 18 cities, or about 2½ per cent, reporting that this system is in use in their departments.

Fire prevention squads are reported as operated by the fire departments in 133 cities.

## EXTINGUISHING FIRES IN LOS ANGELES.

Los Angeles, Cal., covers more than 100 square miles, at least 40 per cent of which area is without fire alarm boxes, the telephone being relied upon. Chief Eley urges that at least 900 more boxes be installed. Of the 2,326 fires in Los Angeles last year, 508 were extinguished by water, 308 by chemical, 123 by water and chemical, 42 by pyrene, 275 by garden hose, 73 by buckets of water, 401 by occupants of the buildings, 378 by wet sacks and 218 smothered or burned out.

To extinguish the 431 fires at which chemical was used took 18,486 gallons of chemical or an average of slightly less than 43 gallons per fire. For the whole 631 fires at which water was used, 648,750 feet of hose was laid, an average of about 1,028 feet of hose per fire. The average distance traveled to the fires was 20½ blocks and the average time required to fight the fire was 1 hour and 26 minutes.

Of the 2,595 alarms received, 585 were by boxes, 199 by telephone and boxes, 1,540 by telephone, 140 still alarms, 15 second alarms, 4 third alarms, 3 fourth alarms 73 by auxiliary boxes, 7 by M. F. D. and 29 by A. D. T.

In San Pedro, a large suburb of Los Angeles, 82 alarms were turned in, 25 of which were box, 50 telephone and 7 still alarms. Of this total 5 were false. Eighteen of the fires were extinguished with water, 16 with chemical, 9 with water and chemical, 5 by a garden hose, 2 by buckets of water, 4 by occupants of the buildings and the remaining 24 were smothered and put out with wet sacks.

To extinguish these 78 fires, 776 gallons of chemical was used, 13,150 feet of hose laid and 286 feet of ladders raised. The loss from buildings amounted to \$31,070 and from contents to \$158,150, a total of \$189,220. Most of this was due to a large fire in January, which caused a loss of \$175,000.

Wilmington, another and smaller suburb, suffered from 12 fires, laid 2,900 feet of hose, and raised 60 feet of ladders. The total time worked was 17 hours and the total loss was \$810.





[illegible]





[illegible]





Niles																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
-------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE NO. 2—MOTOR PROPELLED APPARATUS.—Continued.

City.	Chief's Squad cars, wagons.	Squad Hose wagons.	Hose engines.	Chem- ical engines.	Chem- ical hose ladders.	Hook and Chemical ladder trucks.	Gasoline pumping engines.			Fuel or steam pumping service wagons.	Apparatus named on which tractors are used.	Make of tractors.
							Without hose or chemical.	With hose, chemical.	With hose and chemical.			
<b>Rhode Island:</b>												
Providence	5	1	1	9	1	1	1	1	1	1	1	1
Westerly	1	1	1	1	1	1	1	1	1	1	1	1
<b>South Carolina:</b>												
Aiken	1	1	1	1	1	1	1	1	1	1	1	1
Charleston	1	1	1	1	1	1	1	1	1	1	1	1
Orangeburg	1	1	1	1	1	1	1	1	1	1	1	1
Rock Hill	1	1	1	1	1	1	1	1	1	1	1	1
Spartanburg	1	1	1	1	1	1	1	1	1	1	1	1
<b>Tennessee:</b>												
Chattanooga	2	4	1	2	2	1	2	1	1	1	1	1
Columbia	1	1	1	1	1	1	1	1	1	1	1	1
Park City	1	4	1	1	1	1	1	1	1	1	1	1
Tullahoma	1	1	1	1	1	1	1	1	1	1	1	1
<b>Texas:</b>												
Austin	1	1	1	2	2	1	1	1	1	1	1	1
Beaumont	1	1	1	1	1	1	1	1	1	1	1	1
Bryan	1	1	1	1	1	1	1	1	1	1	1	1
Corsicana	1	1	1	1	1	1	1	1	1	1	1	1
Dallas	1	1	1	1	1	1	1	1	1	1	1	1
El Paso	2	1	1	1	1	1	1	1	1	1	1	1
Fort Worth	1	1	1	1	1	1	1	1	1	1	1	1
Galveston	1	1	1	1	1	1	1	1	1	1	1	1
Hillsboro	1	1	1	1	1	1	1	1	1	1	1	1
Houston	2	1	1	1	1	1	1	1	1	1	1	1
Houston Heights	1	1	1	1	1	1	1	1	1	1	1	1
Mexia	1	1	1	1	1	1	1	1	1	1	1	1
Paris	1	1	1	1	1	1	1	1	1	1	1	1
San Antonio	1	1	1	1	1	1	1	1	1	1	1	1
San Marcos	1	1	1	1	1	1	1	1	1	1	1	1
Sweetwater	1	1	1	1	1	1	1	1	1	1	1	1
Vernon	1	1	1	1	1	1	1	1	1	1	1	1
<b>Utah:</b>												
Salt Lake	1	1	1	1	1	1	1	1	1	1	1	1
<b>Vermont:</b>												
Brattleboro	1	1	1	1	1	1	1	1	1	1	1	1
<b>Virginia:</b>												
Danville	2	1	1	1	1	1	1	1	1	1	1	1
Norfolk	1	1	1	1	1	1	1	1	1	1	1	1
<b>Washington:</b>												
Richmond	3	1	1	1	1	1	1	1	1	1	1	1
Roanoke	1	1	1	1	1	1	1	1	1	1	1	1
Staunton	1	1	1	1	1	1	1	1	1	1	1	1
Suffolk	1	1	1	1	1	1	1	1	1	1	1	1
<b>Washington:</b>												
Anacortes	1	1	1	1	1	1	1	1	1	1	1	1
Bellingham	1	1	1	1	1	1	1	1	1	1	1	1
Centralia	1	1	1	1	1	1	1	1	1	1	1	1
Ellensburg	1	1	1	1	1	1	1	1	1	1	1	1
Everett	1	1	1	1	1	1	1	1	1	1	1	1
Hoquiam	1	1	1	1	1	1	1	1	1	1	1	1
Olympia	1	1	1	1	1	1	1	1	1	1	1	1
Snohomish	1	1	1	1	1	1	1	1	1	1	1	1
Spokane	3	4	1	1	1	1	1	1	1	1	1	1
Tacoma	2	1	1	1	1	1	1	1	1	1	1	1
Vancouver	1	1	1	1	1	1	1	1	1	1	1	1



TABLE NO. 4.—HAND-DRAWN APPARATUS.

	Hose reels.	Hose carts.	H. & L. wagons.	Chem- ical trucks.	Pump- ing engines.
<b>City Arizona:</b>					
Douglas .....	2	..	..	..	..
<b>California:</b>					
Glendale .....	2	..	..	..	..
Hanford .....	2	..	..	..	..
Lodi .....	1	..	..	..	..
Merced .....	2	..	..	..	..
Monterey .....	4	..	..	1	..
Petaluma .....	5	..	..	1	..
Red Bluff.....	1	..	..	1	..
Salinas .....	1	..	..	1	..
San Bernardino.	2	..	..	..	..
San Rafael....	..	5	..	..	..
Santa Monica...	1	..	..	..	..
Venice .....	1	..	..	..	..
Visalia .....	2	..	..	1	..
Whittier .....	1	..	..	..	..
<b>Colorado:</b>					
Alamosa .....	2	..	..	..	..
Boulder .....	..	..	..	1	..
Colo. Springs...	2	..	..	..	..
Monrovia .....	1	..	..	..	..
<b>Connecticut:</b>					
Ansonia .....	6	..	2	..	..
Putnam .....	2	..	2	..	..
So. Manchester.	3	..	..	..	..
Suffield .....	2	..	..	1	..
Windsor Locks.	2	..	..	1	..
<b>Florida:</b>					
Bartow .....	..	..	2	1	2
Daytona .....	2	..	..	..	..
Lake City.....	3	..	..	..	..
St. Petersburg..	2	..	..	1	1
<b>Georgia:</b>					
Elberton .....	1	..	..	..	..
<b>Idaho:</b>					
Weiser .....	..	3	..	1	1
<b>Illinois:</b>					
Carmi .....	2	..	..	..	..
Effingham .....	2	..	..	1	..
Geneva .....	..	1	1	..	..
Harrisburg .....	2	..	..	..	..
Lincoln .....	..	3	..	..	..
Metropolis .....	1	..	..	..	..
Peoria .....	1	..	..	..	..
Rochelle .....	..	1	..	..	..
Sycamore .....	..	..	3	..	..
<b>Indiana:</b>					
Marion .....	1	..	..	..	..
Plymouth .....	2	..	..	..	..
Sullivan .....	1	..	..	..	..
<b>Iowa:</b>					
Fairfield .....	..	..	..	..	3
Washington ...	2	..	..	..	..
<b>Kansas:</b>					
Garden City a...	..	2	..	1 c	..
Hiawatha a....	..	..	..	1 c	..
Newton .....	1	..	..	..	..
Olathe .....	1	..	..	..	..
<b>Maine:</b>					
Auburn .....	1	..	..	..	..
Bridgton .....	3	..	..	1	..
Brunswick ....	1 b	..	..	..	..
Eastport d....	..	..	..	..	..
Ellsworth e....	..	..	..	..	..
Ft. Fairfield...	3	..	..	..	..
Hallowell d....	..	..	..	..	..
Norway .....	..	..	3	1	1 d
Rumford .....	5	..	..	..	..
Van Buren.....	4	..	..	..	..
<b>Maryland:</b>					
Cumberland ...	6	..	..	..	..
<b>Massachusetts:</b>					
Baldwinville e.	..	..	..	..	..
Chicopee .....	3	..	..	1	..
Cohasset .....	..	..	..	..	1
Lenox .....	2	..	..	..	..
Ludlow .....	2	..	2	..	..
Provincetown..	..	..	..	..	2
Rockland .....	..	..	..	..	1
So. Hadley....	1	..	..	..	1
Warren .....	2	..	..	..	..
Webster .....	..	2	..	..	..
Westfield .....	1	..	..	..	..
Whitinsville...	5	..	..	1	..
<b>Michigan:</b>					
Alpena .....	1	..	..	..	..
Dowagiac .....	4	..	..	1	..
Escanaba .....	2	..	..	..	..
Menominee .....	2	..	..	..	..
Niles .....	2	..	..	..	..
Petoskey .....	1	..	..	1	..
Traverse City..	..	2	..	1	..

TABLE NO. 4.—HAND-DRAWN APPARATUS.

Continued.						H. & L. Chem- Pump- ical wagons, trucks, wagons, engine.				
City	Hose reels.	Hose carts.	Hose wagons.	H. & L. carts or trucks.	Chem- ical wagons.	Pump- ing engine.	City	Hose reels.	Hose carts.	H. & L. Chem- Pump- ical wagons, trucks, wagons, engine.
<b>Montana:</b>							<b>South Carolina:</b>			
Lewistown .....	2	..	..	1	..	..	Orangeburg ....	3	..	.. 1 ..
<b>Nebraska:</b>							<b>Tennessee:</b>			
Columbus .....	1	..	..	..	..	..	Columbia .....	3	..	.. ..
Grand Island .....	..	4	..	1	..	..	Fulaski .....	3	..	.. 1 ..
Holdrege .....	..	3	..	1	1	..	Tullahoma .....	..	4	.. ..
Nebraska City .....	2	..	..	..	..	..	<b>Texas:</b>			
<b>New Hampshire:</b>							Bryan .....	..	..	.. 1 ..
Littleton .....	1	..	..	..	1	..	Hillsboro .....	1	..	.. ..
Rochester .....	3	..	..	..	..	..	Houston Hghts. ....	..	..	.. 1 ..
Suncook .....	..	..	3	..	..	..	New Braunfels .....	4	..	.. ..
Walpole .....	1	..	1	1	..	..	Smithville .....	..	2	1 ..
<b>New Jersey:</b>							Sweetwater .....	..	1	.. 1 ..
Freehold .....	..	3	..	1	..	3	Victoria .....	3	..	.. ..
Wharton .....	..	3	..	..	..	..	<b>Utah:</b>			
<b>New York:</b>							Nephi .....	..	1	.. 1 ..
Ballston Spa .....	4	..	1	..	..	..	Spanish Fork .....	2	..	.. ..
Cohoes .....	2	..	..	..	..	..	Springville .....	..	2	.. ..
Dolgeville .....	..	2	..	1	1	..	<b>Vermont:</b>			
Elmira Heights .....	..	4	..	1	..	..	Montpelier .....	..	..	.. .. 1
Goshen .....	2	..	..	..	..	..	<b>Virginia:</b>			
Hornell .....	3	..	..	..	..	..	Farmville .....	5	..	.. 1 ..
Johnstown .....	4	..	..	..	..	..	Harrisonburg .....	6	..	.. ..
Lowville .....	6	..	..	..	9	..	Marion .....	4	..	.. 1 ..
Middletown .....	..	..	2	..	..	..	<b>Washington:</b>			
No. Tarrytown .....	1	..	..	..	..	..	Ancortes .....	4	..	.. ..
Norwich .....	3	..	..	..	..	..	Bellingham .....	..	2	.. ..
Patchogue .....	2	..	..	1	..	..	Colfax .....	5	..	.. ..
Penn Yan .....	..	7	..	1	..	..	Olympia .....	2	..	.. ..
Rensselaer .....	2	..	..	1	..	..	Pullman .....	5	..	.. 1 ..
Southampton .....	8	..	..	..	..	2	Snohomish .....	3	..	.. ..
Tupper Lake .....	4	..	..	..	..	..	<b>West Virginia:</b>			
Walton .....	..	3	..	1	..	..	Charlestown a. ....	5	..	.. 1 .. 2 f
Yonkers .....	..	4 c	..	..	..	..	Davis a. ....	..	..	3 1 ..
<b>North Dakota:</b>							Elkins .....	..	..	.. ..
Valley City .....	2	..	..	1	..	..	Fairmont .....	2	..	.. ..
<b>Ohio:</b>							Hinton a. ....	5	..	.. 1 ..
Bellaire .....	5	..	..	1	1	..	McMechen .....	1	..	.. 1 ..
Celina .....	1	..	..	1	..	..	Martinsburg .....	3	..	.. ..
Cuyahoga Falls .....	..	3	..	..	..	..	Princeton .....	3	..	.. 1 ..
Dennison .....	6	..	..	..	..	..	Wheeling .....	1	..	.. 1 ..
Eaton .....	2	..	..	1	..	..	Williamson .....	5	..	.. 1 ..
Girard .....	1	..	..	..	..	..	<b>Wisconsin:</b>			
Lebanon .....	1	..	1	1	..	1	Baraboo .....	1	..	.. ..
Pt. Clinton .....	..	3	..	1	1	..	Burlington .....	..	3	.. 1 ..
Portsmouth .....	2	..	..	..	..	..	Ft. Atkinson .....	3	..	.. 1 .. 1 g
St. Bernard .....	3	..	..	..	..	..	Hudson .....	2	..	.. ..
Salem .....	3	..	..	1	..	..	Jefferson .....	2	..	.. 1 ..
Steubenville .....	..	2	..	..	2	..	Menominee .....	..	1	.. ..
Tiffin .....	2	..	..	..	..	..	Portage .....	..	1	.. 1 ..
Troy .....	2	..	..	..	..	..	Reedsburg .....	1	..	.. ..
Wadsworth .....	..	..	2	1	..	..	Rice Lake .....	5	..	.. ..
Wooster .....	..	1	..	1	..	..	Stoughton .....	2	..	.. ..
<b>Oklahoma:</b>							Superior .....	3	..	.. 1 ..
Clinton .....	2	..	..	..	..	..	Two Rivers .....	..	3	.. ..
Mangum .....	1	..	..	..	..	..	<b>Wyoming:</b>			
<b>Oregon:</b>							Cheyenne .....	6	..	.. 2 ..
Astoria .....	6	..	..	..	..	..	Evanston a. ....	..	4	.. 1 ..
Baker .....	6	..	..	..	..	..	Lander .....	..	2	.. 1 ..
Klamath Falls .....	..	5	..	1	..	..	<b>Canada:</b>			
La Grande .....	..	..	..	1	..	..	Sault Ste. Marie,	..	..	.. ..
<b>Pennsylvania:</b>							Ont. ....	3	..	.. ..
Archbald .....	4	..	..	..	..	..	a—No other apparatus. Volunteer company.			
Ashley .....	2	..	..	..	..	..	b—Also two hand tubs.			
Bangor .....	3	..	..	1	..	..	c—Also chemical and hose.			
Beaver .....	1	..	..	..	..	..	d—One hand tub.			
Berwick .....	3	..	..	..	..	..	e—Three hand tubs.			
Brookville .....	..	3	..	..	..	..	f—Also one hand water tower.			
Butler .....	2	..	..	..	..	..	g—Also one hand-drawn supply wagon.			
Catasauqua .....	5	..	..	1	..	..				
Clearfield .....	..	..	6	..	..	..				
Coplay .....	..	..	1	..	..	..				
Derry .....	1	..	..	..	1	..				
E. Stroudsburg .....	..	1	..	1	..	..				
Ellwood City .....	2	..	..	..	..	..				
Freedom .....	2	..	..	..	..	..				
Galeton a. ....	..	3	..	1	..	..				
Jersey Shore .....	2	..	..	..	..	..				
Johnsonburg a. ....	..	4	..	..	..	..				
Lansdowne .....	2	..	..	..	..	..				
Larksville .....	3	..	..	..	..	..				
Latrobe .....	5	..	..	1	..	..				
Leighton .....	2	..	..	1	..	..				
Meadville .....	3	..	..	..	..	..				
Monongahela .....	3	..	..	..	..	..				
New Brighton .....	1	..	..	..	..	..				
Nifflin .....	5	..	..	1	..	..				
North East .....	1	..	..	1	..	..				
Portage .....	1	..	..	..	..	..				
Ridgway .....	2	..	..	..	..	..				
St. Clair .....	..	4	..	..	..	..				
Sayre .....	6	..	..	1	1	..				
Shenandoah .....	..	..	..	..	1	..				
So. Bethlehem .....	1	..	..	..	..	..				
Steelton .....	2	..	..	1	..	..				
Sunbury .....	4	..	..	..	..	..				
Turtle Creek .....	2	..	..	..	..	..				
Vandergrift .....	2	..	..	1	..	..				
Weatherly .....	1	..	1	..	..	..				
West Chester .....	..	..	3	..	..	2				

WHEELING FIRE DEPARTMENT RESPONDS TO  
OUTSIDE CALLS.

The Wheeling Fire Department answered calls from outside cities three times last year. In response to a telephone call from Fulton, W. Va., where a bad fire in a large two-story frame building was threatening the town, the auto truck and five men and the chief and another man, were sent. The motor apparatus rendered very efficient service in this case.

Lansing, O., called for help and the engine with two men, the auto truck with five men and the chief and an assistant answered, only to find that the fire was already under control. The third call was from Moundsville, W. Va., where a disastrous fire was raging. The auto truck with seven men responded and assisted in putting out the fire, which destroyed twenty-two houses.



TABLE NO. 3.—GENERAL FIRE DEPARTMENT DATA

City.	No. of fire houses.	(Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
<b>Alabama:</b>							
Birmingham .....	18	167	..	Yes	No	Yes	No
Florence .....	1	2	..	No	..	..	Yes
Montgomery .....	7	53	..	..	..	Yes	Yes
Opelika .....	1	3	10	No	No	Yes	..
Selma .....	3	20	..	No	..	Yes	Yes
Tuscaloosa .....	1	4	6	No	No	Yes	Yes
<b>Arizona:</b>							
Douglas .....	3	5	12	No	No	No	Yes
<b>Arkansas:</b>							
Little Rock .....	6	49	..	No	No	Yes	No a
Pine Bluff .....	..	15	..	..	..	Yes	No
Texarkana .....	3	18	..	..	..	Yes	No
<b>California:</b>							
Alameda .....	5	24	35	No	No	No	Yes
Alhambra .....	3	7	40	No	No	No	Yes
Berkeley .....	9	74	..	..	Yes	Yes	Yes
Fresno .....	7	52	8	No	No	Yes	No
Los Angeles .....	39	437	..	..	..	..	..
Salinas .....	1	3	25	No	No	No	Yes
San Bernardino .....	3	8	35	No	No	Yes	Yes
San Leandro .....	1	2	11	..	..	Yes	Yes
San Rafael .....	4	2	100	No	No	..	Yes
Santa Cruz .....	3	8	20	..	..	Yes	Yes
Santa Monica .....	2	9	22	..	No	Yes	Yes
Santa Rosa .....	1	6	6	No	No	Yes	Yes
South Pasadena .....	1	2	..	No	No	No	Yes
Venice .....	2	2	..	Yes	No	Yes	Yes
Visalia .....	2	5	45	No	No	No	Yes
Whittier .....	1	3	12	No	No	No	Yes
Woodland .....	1	3	30	No	No	No	Yes
<b>Colorado:</b>							
Alamosa .....	1	1	6	..	No	Yes	2
Boulder .....	3	8	2	No	No	Yes	Yes
Colorado Springs .....	4	28	..	Yes	No	Yes	Yes
La Junta .....	1	2	20	No	No	Yes	Yes
Longmont .....	1	3	9	Yes	..	Yes	Unknown
Pueblo .....	6	55	..	..	Yes	Yes	No
Trinidad .....	2	7	6	No	No	Yes	Yes
Victor .....	1	4	4	No	No	Yes	Yes
<b>Connecticut:</b>							
Ansonia .....	3	0	220	No	No	No	No
Danbury .....	8	13	227	No	No	No	Yes
Danielson .....	2	0	48	No	No	No	Yes
Middletown .....	3	8	165	No	No	No	No
New Britain .....	5	27	58	No	No	Yes	Yes
New Canaan .....	1	1	55	..	..	No	Yes b
Norwich .....	7	22	74	No	No	No	..
New Haven .....	14	170	55	No	No	Yes	No
Putnam .....	3	0	..	Yes	..	Yes	Yes
South Manchester .....	4	150	..	..	..	..	Not all
Stamford .....	3	31	13	..	No	Yes	Yes b
Stratford .....	1	1	50	No	No	Yes	Yes
Suffield .....	2	50	..	..	Yes	Yes	Yes
Wallingford .....	3	3	72	No	No	No	Yes
Waterbury .....	7	80	..	..	No	Yes	Yes
West Haven .....	4	2 c	100	..	No	..	Yes
Windsor Locks .....	1	0	45	No	No	No	Not all
<b>Florida:</b>							
Bartow .....	1	1	16	No	No	No	Yes
Daytona .....	1	2	92	No	No	No	Yes
Gainesville .....	1	2	30	No	No	No	No
Jacksonville .....	7	94	..	Yes	No	Yes	Yes
Key West .....	3	14	125	No	No	No	Yes
Lake City .....	2	5	23	..	..	..	Yes
Miami .....	1	22	..	Yes	No	..	..
St. Petersburg .....	2	6	15	Yes	No	Yes	No
Tampa .....	6	50	..	..	..	Yes	Yes
<b>Georgia:</b>							
Albany .....	1	10	..	Yes	No	Yes	Not all
Americus .....	..	7	..	No	No	Yes	Yes
Athens .....	2	20	..	No	No	No	Yes
Augusta .....	7	73	..	..	No	Yes	Yes
Brunswick .....	1	10	..	No	No	No	Yes
Carrollton .....	1	2	20	No	No	Yes	Unknown
Cartersville .....	1	4	30	Yes	No	Yes	Yes
Columbus .....	5	38	..	No	No	Yes	Yes
Dawson .....	1	4	8	No	No	No	No
Douglas .....	..	0	20	No	No	No	Yes
Elberton .....	1	1	10	No	No	No	Yes
Hawkinsville .....	2	2	10	No	No	No	Yes
La Grange .....	1	2	8	No	No	No	Unknown
Macon .....	5	72	..	Yes	No	Yes	Yes
Quitman .....	1	3	16	No	No	Yes	Yes
Rome .....	4	24	..	Yes	No	Yes	a
Savannah .....	7	103	..	..	No	..	d
<b>Idaho:</b>							
Idaho Falls .....	1	3	15	No	No	Yes	Yes
Weiser .....	3	25	..	No	No	Yes	a
<b>Illinois:</b>							
Aurora .....	5	30	..	..	No	Yes	Yes
Beardstown .....	1	1	..	No	No	Yes	Yes
Belleville .....	2	18	..	No	No	Yes	Yes
Belvidere .....	2	8	1	..	No	Yes	Yes
Berwyn .....	2	9	16	Yes	..	Yes	Yes
Bloomington .....	5	35	..	Yes	No	Yes	Yes

TABLE NO. 3—GENERAL FIRE DEPARTMENT DATA.—Continued.

City.	No. of fire houses.	(Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
Canton	1	6	4	....	No	Yes	Yes
Carmi	..	..	..	....	....	....	No
Champaign	2	8	..	....	....	Yes	Yes
Chicago Heights	2	13	20	No	No	No	Yes
Cicero	5	37	..	Yes	No	Yes	d
Danville	6	35	..	No	No	....	Yes
Decatur	4	35	..	Yes	No	Yes	Yes
Dixon	1	4	..	No	No	Yes	Yes
Edwardsville	1	3	20	No	No	Yes	Yes
Eftingham	1	0	42	No	No	No	Unknown
Fairbury	1	0	14	No	No	No	Yes
Galena	5	125	..	No	No	Yes	Yes
Geneva	1	..	17	No	No	No	Unknown
Harrisburg	2	5	6	Yes	....	Yes	....
Highland Park	..	2	12	No	....	....	Yes
Jacksonville	1	9	5	No	No	Yes	....
Joliet	5	38	..	....	....	Yes	Yes
Kewanee	1	6	15	No	No	Yes	No
Lincoln	1	5	..	No	No	Yes	Yes
Macomb	1	1	9	Yes	....	Yes	Yes
Metropolis	2	1	16	No	....	Yes	Yes
Moline	5	29	..	Yes	No	Yes	Yes
Mt. Vernon	1	6	8	Yes	No	Yes	Yes
Oak Park	6	20	..	No	No	Yes	Yes
Oglesby	1	13	..	No	No	Yes	Yes
Olney	1	2	5	No	No	Yes	Yes
Pekin	1	5	25	No	No	Yes	Yes
Peoria	10	83	25	No	No	Yes	Yes
Pontiac	1	1	10	No	No	No	No
Quincy	8	43	5	....	No	Yes	....
Rochelle	1	2	18	Yes	No	Yes	Yes
Sparta	1	..	..	....	....	....	....
Sterling	1	5	10	....	No	Yes	Yes
Streator	2	10	..	No	No	Yes	Yes
Sycamore	2	48	..	No	No	No	Yes
Urbana	1	6	2	No	No	Yes	Yes
Waukegan	2	13	3	No	No	Yes	No
Westville	..	2	12	Yes	....	Yes	Yes
Woodstock	..	..	..	No	No	Yes	Yes
<b>Indiana:</b>							
Alexandria	1	4	3	No	No	Yes	Yes
Anderson	5	24	..	No	No	Yes	Yes
Auburn	1	12	..	....	....	....	....
Bloomington	1	7	..	No	No	Yes	Yes
Columbia City	1	2	38	No	No	Yes	Yes
Huntington	2	12	..	Yes	No	Yes	Yes
Indianapolis	28	330	..	No	No	Yes	No
Kokomo	3	16	..	....	....	Yes	Yes
Lafayette	5	23	..	No	....	Yes	No
Logansport	5	23	..	No	No	Yes	Some
Marion	6	23	15	No	No	Yes	No
Martinsville	..	..	20	....	No	Yes	Yes
Michigan City	3	20	24	....	....	Yes	No
Mishawaka	2	12	..	No	No	No	Yes
Montpelier	1	20	..	No	No	No	....
Muncie	3	23	..	No	No	Yes	No
North Vernon	1	1	20	No	No	No	Yes
Plymouth	1	2	20	No	No	Yes	Yes
Richmond	5	26	..	No	No	Yes	Yes
Rochester	1	2	6	Yes	No	Yes	No
Seymour	1	4	6	No	No	No	Yes
South Bend	9	66	..	No	No	Yes	Yes
Sullivan	1	2	7	....	....	No	No
Terre Haute	9	71	..	No	No	Yes	Yes
Wabash	2	7	8	....	....	Yes	Yes
Warsaw	3	1	..	....	....	Yes	Yes
Whiting	1	5	..	No	No	Yes	No
<b>Iowa:</b>							
Cedar Rapids	6	36	..	No	No	Yes	Yes
Davenport	7	45	..	No	No	Yes	Yes
Des Moines	15	123	5	No	No	Yes	No
Fairfield	2	16	..	No	No	No	Yes
Iowa City	..	3	55	No	No	Yes	Yes
Marshalltown	2	11	..	No	No	Yes	Yes
Mason City	1	10	..	Yes	....	Yes	No
Sioux City	8	49	50	No	No	Yes	No
Washington	2	..	..	No	No	Yes	Yes
Waterloo	2	26	..	Yes	No	Yes	No
Webster City	1	2	10	....	....	Yes	Yes
<b>Kansas:</b>							
Abilene	1	2	12	No	No	Yes	Yes
Atchison	7	16	..	Yes	No	Yes	Yes
Garden City	..	32	..	No	No	No	Yes
Hiawatha	1	12	25	No	No	Yes	No
Hutchinson	3	12	..	....	No	Yes	Yes
Kansas City	15	112	..	Yes	Yes	Yes	No
Lawrence	1	3	12	No	No	Yes	Yes
Manhattan	1	2	8	..	....	....	....
Newton	1	4	6	No	No	Yes	Yes
Olathe	2	1	0	No	No	Yes	Yes
Parsons	5	11	..	No	No	Yes	Yes
Salina	1	5	..	Yes	No	Yes	No
Topeka	6	53	..	No	No	Yes	No
Winfield	1	5	6	Yes	No	Yes	No
<b>Kentucky:</b>							
Bowling Green	1	11	..	No	No	No	No
Cynthiana	1	1	35	No	....	No	Yes
Dayton	1	..	..	No	No	Yes	Yes
Henderson	2	12	..	Yes	No	Yes	Unknown
Hopkinsville	..	4	8	No	No	No	Some
Lexington	5	37	..	Yes	No	Yes	No
Louisville	26	282	25	No	No	Yes	No
Morganfield	1	1	8	....	....	No	Yes
Newport	3	16	..	....	....	....	Yes
Paducah	16	38	..	No	No	Yes	Yes
Richmond	2	2	15	No	No	No	Yes
Shelbyville	1	4	12	No	No	Yes	Yes
Shreveport	6	42	..	Yes	No	Yes	Yes

TABLE NO. 3—GENERAL FIRE DEPARTMENT DATA.—Continued.

City.	No. of fire houses.	Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
<b>Louisiana:</b>							
Thibodaux .....	5	..	..	No	No	No	Yes
<b>Maine:</b>							
Auburn .....	2	6	45	No	No	Yes	Yes
Biddeford .....	9	55	9	No	No	Yes	Yes
Bridgton .....	3	..	33	No	No	No	Yes
Brunswick .....	..	..	..	..	..	..	Yes
Dexter .....	3	..	73	No	No	Yes	Yes
Eastport .....	3	23	..	No	No	No	Yes
Ellsworth .....	2	2	30	No	..	No	Unknown
Ft. Fairfield .....	3	..	27	No	No	No	Yes
Gardiner .....	6	..	83	..	..	..	Yes
Hallowell .....	1	1	35	..	..	Yes	Yes
Lubec .....	1	26	50	..	..	..	Yes
Norway .....	1	..	61	No	No	Yes	Yes
Rumford .....	3	2	70	No	No	No	Yes
Sanford .....	3	1	120	Yes	No	Yes	Yes
Skowhegan .....	1	3	50	No	No	No	Unknown
South Paris .....	5	..	75	..	..	..	Yes
Van Buren .....	4	..	60	No	..	..	Yes
Winslow .....	1	..	12	No	No	Yes	Yes
<b>Maryland:</b>							
Baltimore .....	50	790	75	..	No	Yes	No
Cumberland .....	3	19	..	Yes	No	Yes	No
Easton .....	1	..	..	..	..	..	Some
<b>Massachusetts:</b>							
Adams .....	2	..	40	..	..	..	Yes
Amherst .....	3	..	46	No	No	No	Yes
Arlington .....	3	9	28	No	No	No	Yes
Baldwinville .....	4	..	155	No	No	..	No
Beverly .....	6	18	123	Yes	No	Yes	Yes
Boston .....	65	990	..	No	No	Yes	Yes
Brockton .....	6	65	27	No	No	Yes	Yes
Brookline .....	7	72	7	..	No	..	Yes
Cambridge .....	13	113	24	No	No	Yes	Yes
Chelsea .....	5	36	32	No	No	No	Yes
Chicopee .....	6	19	94	No	No	No	Yes
Cohasset .....	4	1	63	No	No	Yes	Yes
Dedham .....	3	6	42	No	No	No	Yes
Easthampton .....	2	4	36	..	..	..	..
Fitchburg .....	6	42	60	No	No	Yes	Yes
Foxborough .....	1	..	30	..	..	No	Yes
Framingham .....	3	9	59	..	..	Yes	Yes
Greenfield .....	2	3	50	..	..	..	Yes
Haverhill .....	7	40	45	No	No	Yes	Yes
Hingham .....	5	3	100	No	No	No	Yes
Lenox .....	2	2	120	No	Yes	Yes	Yes
Lowell .....	14	135	42	No	No	Yes	Yes
Ludlow .....	2	1	50	..	..	..	Yes
Lynn .....	10	96	51	Yes	No	Yes	Yes
Malden .....	6	49	10	No	No	Yes	Yes
Manchester .....	1	2	35	No	..	..	Yes
Mansfield .....	..	..	39	Yes	No	Yes	Yes
Marblehead .....	2	5	36	..	..	..	..
Maynard .....	1	2	30	No	No	Yes	No
Medfield .....	1	..	32	No	No	..	Yes
Medford .....	5	20	22	No	No	Yes	Yes
New Bedford .....	11	102	96	No	No	No	Yes
Newton .....	10	49	47	No	No	Yes	Yes
North Easton .....	1	2	30	..	..	Yes	Yes
Peabody .....	5	10	65	No	No	No	Yes
Peabody .....	2	5	66	No	No	No	Yes
Plymouth .....	6	..	126	No	No	Yes	No
Provincetown .....	2	2	28	No	No	No	Yes
Reading .....	14	22	46	No	No	No	Yes
Revere .....	2	1	65	No	No	Yes	Yes
Rockland .....	4	28	80	No	No	Yes	Yes
Salem .....	2	..	..	No	No	No	Yes
Somerset .....	8	70	30	No	No	Yes	Yes
Somerville .....	1	..	36	..	..	..	..
South Hadley .....	3	8	23	No	No	No	Yes
Swampscott .....	3	..	60	No	No	Yes	..
Taunton .....	8	31	48	No	No	No	Yes
Wakefield .....	4	6	50	..	..	Yes	Yes
Walpole .....	3	23	55	Yes	No	Yes	Yes
Waltham .....	5	..	59	No	No	No	Yes
Warren .....	2	10	18	Yes	No	Yes	Yes
Watertown .....	1	..	65	..	..	..	..
Webster .....	3	4	42	No	No	Yes	Yes
Wellesley .....	2	9	52	No	No	No	1
Westfield .....	1	..	40	No	No	No	No
Whitinsville .....	..	8	24	No	No	Yes	Yes
Winthrop .....	18	212	..	..	..	..	..
Worcester .....	..	..	..	..	..	..	..
<b>Michigan:</b>							
Alpena .....	3	10	9	..	..	Yes	Yes
Ann Arbor .....	2	20	..	Yes	No	Yes	No
Battle Creek .....	4	35	27	No	No	No	Yes
Bay City .....	9	32	27	No	No	Yes	Yes
Coldwater .....	1	2	13	No	No	No	Yes
Detroit .....	46	740	..	No	No	Yes	Some
Dowagiac .....	1	3	6	No	..	Yes	Yes
East Jordan .....	1	..	18	..	..	Yes	No
Escanaba .....	3	14	2	No	No	..	No
Flint .....	3	38	..	..	..	..	No
Grand Haven .....	2	2	10	No	No	Yes	Some
Grand Rapids .....	12	172	..	Yes	No	Yes	Some
Greenville .....	1	..	12	..	..	..	..
Hastings .....	1	..	20	No	..	Yes	Yes
Holland .....	2	8	30	..	No	Yes	..
Ionia .....	1	2	20	..	..	..	..
Jackson .....	5	41	..	Yes	No	Yes	Yes
Lansing .....	5	45	..	Yes	No	Yes	Some
Lapeer .....	1	..	14	No	No	..	Yes
Menominee .....	3	15	..	No	No	Yes	Yes
Marine City .....	3	80	..	No	..	No	..
Monroe .....	..	3	8	No	No	Yes	Yes
Mt. Clemens .....	1	6	20	No	No	Yes	Yes



TABLE NO. 3—GENERAL FIRE DEPARTMENT DATA.—Continued.

City.	No. of fire houses.	Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
Mt. Pleasant .....	1	12	..	No	No	Yes	Yes
Niles .....	3	3	15	No	No	Yes	Yes
Otsego .....	1	1	75	Yes	....	....	Yes
Owosso .....	2	12	..	....	....	Yes	Yes
Petoskey .....	2	1	30	No	No	Yes	Yes
Pontiac .....	2	14	..	No	No	Yes	Yes
Red Jacket .....	1	..	17	No	No	No	No
St. Joseph .....	1	3	15	No	No	Yes	No
Traverse City .....	4	7	36	No	No	Yes	Yes
<b>Minnesota:</b>							
Albert Lea .....	1	2	24	No	No	Yes	....
Anoka .....	1	3	24	Yes	Yes	Yes	Yes
Austin .....	2	2	38	No	No	Yes	Some
Brainerd .....	3	2	..	No	No	....	....
Cloquid .....	1	8	..	No	No	....	....
Crookston .....	1	2	23	No	No	No	Unknown
Duluth .....	10	112	..	No	No	Yes	Yes
East Grand Forks .....	1	2	10	....	....	Yes	Yes
Faribault .....	5	2	40	No	No	Yes	Yes
Luverne .....	1	..	36	No	No	No	Yes
Minneapolis .....	31	421	..	No	No	Yes	No
New Ulm .....	2	9	47	....	....	Yes	....
Owatoma .....	2	7	20	....	....	....	Yes
Pipestone .....	1	1	59	No	No	Yes	Yes
Red Wing .....	2	9	30	Yes	No	Yes	Yes
Rochester .....	2	4	23	No	No	Yes	Yes
St. Cloud .....	1	6	..	....	....	Yes	Yes
Stillwater .....	1	8	2	....	No	Yes	No
Virginia .....	1	14	..	Yes	No	Yes	Yes
Winona .....	4	31	..	Yes	No	Yes	Yes
<b>Mississippi:</b>							
Greenville .....	4	18	..	No	No	Yes	Yes
Hattiesburg .....	3	11	..	No	No	Yes	Yes
Jackson .....	4	33	..	Yes	No	Yes	Yes
Meridian .....	6	31	5	No	No	Yes	No
Vicksburg .....	6	30	..	No	No	Yes	No
<b>Missouri:</b>							
Carthage .....	1	7	..	No	No	Yes	No
Clinton .....	1	3	8	No	No	No	No
Fulton .....	1	..	..	No	No	Yes	Probably
Kansas City .....	27	391	..	No	Yes	Yes	No
Macon .....	1	2	8	....	....	No	Yes
Moberly .....	1	4	1	No	No	No	Yes
Poplar Bluff .....	1	2	8	No	....	Yes	Yes
Rich Hill .....	1	..	10	No	No	No	Yes
Sedalia .....	2	9	..	No	No	Yes	No
<b>Montana:</b>							
Billings .....	2	14	15	Yes	Yes	Yes	Yes
Bozeman .....	1	3	50	Yes	No	Yes	Yes
Butte .....	4	53	..	Yes	Yes	Yes	Yes
Great Falls .....	3	20	..	....	Yes	....	Yes
Kalispell .....	2	2	40	No	No	No	....
Lewistown .....	1	4	20	No	No	No	Yes
Miles City .....	1	3	25	No	Yes	Yes	Yes
Missoula .....	1	9	..	No	No	No	Yes
<b>Nebraska:</b>							
Columbus .....	1	1	72	No	No	Yes	Yes
Grand Island .....	4	5	80	....	No	Yes	Yes
Holdrege .....	1	..	48	....	No	Yes	No
Nebraska City .....	2	2	50	No	No	Yes	Yes
Omaha .....	15	208	..	No	Yes	Yes	No
South Omaha .....	5	38	..	....	Yes	Yes	Yes
<b>Nevada:</b>							
Carson .....	1	1	75	No	No	No	Yes
<b>New Hampshire:</b>							
Concord .....	6	12	200	No	No	No	No
Franklin .....	2	..	43	No	No	Yes	Yes
Littleton .....	2	..	23	No	No	No	No
Manchester .....	10	70	125	No	No	Yes	No
Nashua .....	4	27	60	No	No	No	Yes
Newport .....	2	..	35	No	No	No	Yes
Rochester .....	5	..	65	No	No	Yes	Yes
Suncook .....	1	14	4	....	....	Yes	Yes
Walpole .....	1	..	20	No	No	No	Yes
<b>New Jersey:</b>							
Asbury Park .....	8	8	170	....	....	....	Yes
Atlantic City .....	7	136	..	No	No	....	Yes
Camden .....	10	112	..	No	No	Yes	Yes
Collingswood .....	2	..	100	....	....	....	Yes
East Orange .....	2	45	..	No	....	Yes	Yes
Freehold .....	1	2	40	No	No	No	Yes
Glen Ridge .....	1	..	..	No	No	No	Yes
Hackensack .....	5	16	130	No	No	No	Yes
Hammonton .....	2	35	..	No	No	No	Yes
Irvington .....	2	12	25	No	No	No	Yes
Lambertville .....	4	..	..	Yes	No	Yes	Yes
Long Branch .....	8	17	600	No	No	No	Yes
Madison .....	1	1	80	Yes	....	Yes	Yes
Morristown .....	5	5	250	Yes	....	....	Yes
Nutley .....	3	3	56	No	No	No	No
Passaic .....	6	47	..	....	....	Yes	Yes
Paterson .....	12	145	..	....	....	Yes	Yes
Phillipsburg .....	6	..	..	No	No	No	Yes
Plainfield .....	4	22	..	No	No	Yes	Yes
Ridgewood .....	2	35	..	....	....	....	Yes
Rutherford .....	4	..	..	No	....	....	No
Salem .....	4	..	200	No	No	No	No
Summit .....	4	2	..	Yes	No	Yes	Yes
Westfield .....	1	4	40	Yes	....	....	Yes
West Hoboken .....	6	25	..	Yes	No	Yes	Yes
Wharton .....	1	..	75	....	....	....	Yes

TABLE NO. 3—GENERAL FIRE DEPARTMENT DATA.—Continued.

City.	No. of fire houses.	Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
<b>New York:</b>							
Albany .....	14	175	21	Yes	No	Yes	Some
Albion .....	3	3	230	....	....	Yes	Yes
Amsterdam .....	6	32	..	No	No	Yes	No
Auburn .....	5	47	14	No	No	Yes	No
Babylon .....	4	..	..	....	....	Yes	Yes
Ballston Spa .....	2	..	90	No	....	Yes	Yes
Binghamton .....	7	64	3	Yes	No	No	Yes
Cohoes .....	6	21	182	No	No	Yes	Yes
Corning .....	2	10	130	Yes	No	Yes	Yes
Dolgeville .....	2	..	95	....	....	....	....
Eastchester .....	6	..	260	No	....	....	Yes
Elmira .....	5	45	1	No	No	Yes	Yes
Elmira Heights .....	4	..	60	No	....	No	Yes
Fulton .....	4	9	16	No	No	Yes	Yes
Gloversville .....	3	15	20	....	....	....	No
Goshen .....	3	..	130	No	No	....	....
Hornell .....	3	8	165	No	No	Yes	Yes
Ithaca .....	8	11	510	No	No	No	No
Jamestown .....	5	40	8	No	No	Yes	Yes
Johnstown .....	2	4	100	No	Yes	Yes	Yes
Lockport .....	4	20	15	No	No	Yes	Yes
Lowville .....	7	..	56	No	No	No	Yes
Malone .....	1	4	40	No	No	Yes	Yes
Middletown .....	7	6	..	No	No	No	Yes
New York .....	258	4,898	..	Yes g	....	Yes	....
New Rochelle .....	6	27	368	No	No	No	Yes
North Tarrytown .....	3	..	200	No	No	No	Yes
Norwich .....	2	..	120	No	....	Yes	No
Ogdensburg .....	5	13	15	No	No	Yes	Yes
Oneida .....	2	5	70	No	No	Yes	No
Ossining .....	9	..	250	No	No	No	Yes
Oswego .....	4	17	11	No	No	No	Yes
Patchogue .....	2	..	175	....	....	Yes	Yes
Peekskill .....	4	5	400	No	No	No	Yes
Penn Yan .....	2	..	135	No	No	No	No
Poughkeepsie .....	7	..	..	No	No	....	Yes
Rensselaer .....	5	6	..	No	No	No	No
Rome .....	3	17	125	No	No	Yes	Yes
Schenectady .....	11	90	300	Yes	No	Yes	Yes
Southampton .....	8	..	100	No	No	No	Yes
Suffern .....	3	..	80	No	No	Yes	No
Syracuse .....	16	181	..	No	No	Yes	Some
Tarrytown .....	5	..	225	....	....	....	Yes
Tupper Lake .....	3	..	..	No	....	Yes	Yes
Utica .....	9	109	..	No	No	Yes	no
Walton .....	2	..	128	No	No	Yes	Yes
Waterloo .....	6	..	200	No	No	No	Yes
Westfield .....	1	..	96	No	No	No	Yes
White Plains .....	7	1	250	....	....	Yes	Yes
Yonkers .....	9	126	350	....	Yes	No	Yes
<b>North Carolina:</b>							
Burlington .....	1	1	22	....	....	Yes	Yes
Charlotte .....	2	24	..	Yes	....	Yes	Some
Elizabeth City .....	1	2	18	No	....	....	Yes
Henderson .....	1	2	40	No	No	Yes	Yes
<b>North Dakota:</b>							
Valley City .....	1	..	54	Yes	No	Yes	No
<b>Ohio:</b>							
Akron .....	8	82	..	Yes	No	Yes	Yes
Alliance .....	3	15	3	No	No	Yes	No
Ashland .....	1	2	50	....	....	Yes	....
Barnesville .....	1	25	..	....	....	Yes	Yes
Bellefontaine .....	2	7	6	....	....	Yes	Yes
Bellevue .....	1	..	..	No	No	No	Yes
Bryan .....	1	3	13	No	No	Yes	Some
Byeville .....	1	..	27	Yes	No	Yes	Some
Celina .....	1	4	..	No	No	Yes	Yes
Chillicothe .....	3	12	..	Yes	No	Yes	Yes
Circleville .....	1	6	..	No	....	Yes	Unknown
Cleveland Heights .....	1	1	16	No	No	Yes	Yes
Columbus .....	17	284	..	Yes	No	Yes	Yes
Conneaut .....	4	11	6	Yes	No	Yes	Yes
Coshocton .....	1	6	..	Yes	No	....	No
Cuyahoga Falls .....	1	..	27	Yes	No	Yes	Yes
Defiance .....	2	3	75	No	No	Yes	Some
Delphos .....	4	3	25	....	....	....	....
Dennison .....	3	..	72	No	No	No	Yes
East Cleveland .....	1	10	..	....	....	Yes	Yes
East Liverpool .....	4	16	24	Yes	No	Yes	No
Eaton .....	1	24	20	No	No	No	Yes
Elyria .....	3	24	..	No	No	Yes	Yes
Findlay .....	2	14	..	Yes	No	Yes	Yes
Gallion .....	2	5	70	No	No	No	Yes
Girard .....	1	..	..	No	No	Yes	No
Hamilton .....	7	41	..	No	No	No	No
Jackson .....	1	5	..	....	No	Yes	No
Lancaster .....	1	7	..	No	No	Yes	Yes
Lebanon .....	2	16	..	No	No	Yes	Yes
Lima .....	4	35	90	Yes	No	Yes	Yes
Lorain .....	8	30	..	....	....	Yes	Yes
Mansfield .....	4	20	4	....	....	Yes	No
Marietta .....	2	12	..	No	No	Yes	Yes
Marion .....	2	13	8	No	No	Yes	....
Middletown .....	..	10	..	....	....	....	No
Mt. Vernon .....	2	6	..	No	No	No	No
Napoleon .....	1	3	12	No	No	Yes	No
Nelsonville .....	2	2	6	....	No	Yes	Yes
Newark .....	4	23	..	No	No	Yes	Yes
Niles .....	1	3	9	No	No	No	Yes
Norwood .....	3	21	..	....	....	Yes	Yes
Oberlin .....	1	1	25	....	....	....	Yes
Port Clinton .....	2	..	..	No	No	Yes	Yes
Portsmouth .....	3	26	..	No	No	No	Yes
Ravenna .....	1	1	16	No	No	Yes	No

TABLE NO. 3—GENERAL FIRE DEPARTMENT DATA.—Continued.

City.	No. of fire houses.	Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
St. Bernard .....	3	5	25	No	No	No	Yes
St. Marys .....	1	3	..	No	No	Yes	Yes
Salem .....	3	2	100	No	No	No	No
Springfield .....	9	43	..	Yes	No	Yes	Yes
Steubenville .....	4	15	40	Yes	..	Yes	Yes
Tiffin .....	2	13	12	No	No	Yes	Yes
Toledo .....	17	234	..	No	No	Yes	Unknown
Troy .....	1	6	30	Yes	No	No	No
Wadsworth .....	1	..	..	..	..	Yes	Yes
Warren .....	2	10	..	..	No	Yes	No
Wellsville .....	3	3	36	No	No	Yes	No
Wooster .....	..	4	18	Yes	..	Yes	Yes
Youngstown .....	11	88	..	No	e	Yes	No
<b>Oklahoma:</b>							
Bartlesville .....	1	7	4	Yes	No	Yes	Yes
Clinton .....	1	..	12	No	No	No	Yes
Durant .....	1	6	6	..	..	Yes	Yes
Enid .....	6	12	..	No	No	No	No
Lawton .....	1	6	..	Yes	No	Yes	Yes
McAllister .....	2	12	..	Yes	Yes	Yes	Yes
Mangum .....	1	3	6	Yes	No	Yes	Yes
Muskogee .....	4	35	25	Yes	No	Yes	Some
Oklahoma City .....	10	74	..	Yes	No	Yes	No
Okmulgee .....	1	3	6	..	No	Yes	Yes
<b>Oregon:</b>							
Astoria .....	4	11	19	Yes	No	Yes	No
Baker .....	1	4	20	No	No	Yes	Some
Klamath Falls .....	1	1	22	No	No	No	..
La Grande .....	1	3	25	No	No	Yes	No
<b>Pennsylvania:</b>							
Altoona .....	9	56	14	..	..	Yes	Yes
Archbald .....	4	..	200	..	..	..	Yes
Ashby .....	1	..	28	No	No	No	Yes
Bangor .....	3	..	..	No	..	No	No
Beaver .....	1	1	35	No	..	No	Yes
Berwick .....	3	..	..	..	..	..	Yes
Bristol .....	5	..	600	No	No	No	Yes
Brookville .....	3	..	40	No	No	No	Yes
Butler .....	3	17	45	No	No	Yes	No
Carbondale .....	3	3	..	No	No	No	Yes
Carlisle .....	5	..	..	..	..	..	Yes
Catasauqua .....	3	..	..	No	No	No	No
Cnabersburg .....	5	8	..	No	..	No	Some
Clearfield .....	4	..	300	No	No	Yes	Yes
Coatesville .....	2	..	150	No	No	No	No
Connellsville .....	2	7	35	Yes	..	Yes	Yes
Coplay .....	1	..	..	..	..	..	..
Derry .....	2	..	42	No	No	No	Yes
Easton .....	5	20	28	No	No	No	No
East Stroudsburg .....	1	..	60	..	..	Yes	Yes
Ellwood City .....	1	..	39	..	..	..	Yes
Erie .....	10	102	9	Yes	..	Yes	No
Farrell .....	2	4	68	No	No	No	Yes
Franklin .....	1	2	12	No	No	No	Yes
Freedom .....	3	60	..	..	..	..	Yes
Galeton .....	3	..	..	No	..	No	Yes
Gallitzin .....	1	..	..	No	No	No	Yes
Girardville .....	2	..	..	..	..	..	Yes
Harrisburg .....	14	24	..	..	..	..	Yes
Hollidaysburg .....	1	..	..	No	No	No	Yes
Honesdale .....	5	..	300	No	..	No	Yes
Jersey Shore .....	1	2	30	No	No	Yes	Yes
Johnstown .....	9	68	..	No	No	Yes	No
Johnsonburg .....	3	..	..	No	No	No	No
Lansdowne .....	1	..	50	No	No	..	Yes
Larksville .....	4	3	150	Yes	No	Yes	Yes
Latrobe .....	5	110	..	No	No	No	Yes
Lehighton .....	2	..	225	No	No	No	Yes
McKeesport .....	4	36	..	No	No	Yes	Yes
Mauch Chunk .....	3	..	..	No	No	No	Yes
Meadville .....	4	6	50	No	No	No	Yes
Miners' Mills .....	2	..	80	Yes	No	Yes	Yes
Monongahela .....	1	..	50	No	..	No	Yes
New Brighton .....	4	2	40	No	No	Yes	Yes
New Castle .....	7	25	180	No	No	Yes	Yes
Nifflin .....	4	..	..	No	No	No	Unknown
Norristown .....	5	12	..	No	No	No	Yes
Northampton .....	3	..	300	..	..	..	Some
North East .....	2	..	37	No	No	No	Yes
Oil City .....	5	11	30	No	No	No	No
Phillipsburg .....	2	..	200	..	..	..	No
Pittsburgh .....	63	811	..	..	No	Yes	..
Portage .....	1	..	35	No	..	No	..
Punxsutawney .....	2	..	..	..	..	..	..
Quakertown .....	3	..	50	No	No	No	No
Reading .....	13	26	..	No	No	No	Yes
Ridgeway .....	4	..	130	No	No	No	Yes
St. Clair .....	4	..	..	Yes	No	Yes	Yes
Sayre .....	3	..	120	No	..	No	Some
Scranton .....	19	130	24	No	No	Yes	Yes
Sharon .....	1	6	..	No	No	Yes	No
Shenandoah .....	4	..	150	No	..	Yes	Yes
South Bethlehem .....	4	4	..	No	No	No	No
South Fork .....	1	..	130	..	..	..	Yes
Steelton .....	6	..	800	..	..	..	Nearly all
Sunbury .....	8	6	1,200	No	..	No	Yes
Turtle Creek .....	1	..	42	..	..	Yes	Yes
Tyrone .....	3	..	80	No	No	Yes	Yes
Vandergrift .....	1	..	50	Yes	..	Yes	Yes
Warren .....	3	5	140	No	No	No	Unknown
Washington .....	1	6	12	No	No	Yes	Yes
Waynesboro .....	1	2	240	No	Yes	Yes	No
Weatherley .....	1	..	60	No	..	No	Yes
Westchester .....	3	..	350	No	No	No	No



TABLE NO. 3—GENERAL FIRE DEPARTMENT DATA.—Continued.

City.	No. of fire houses.	Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
West Newton.....	2	..	50	No	No	Yes	....
Wilkes-Barre .....	7	50	54	Yes	No	Yes	No
Williamsport .....	6	27	33	No	No	Yes	Yes
Windber .....	1	..	..	....	....	No	Yes
<b>Rhode Island:</b>							
Providence .....	28	334	..	No	No	Yes	No
South Kingston.....	2	..	125	....	....	....	Yes
Westerley .....	1	..	135	....	....	....	Yes
<b>South Carolina:</b>							
Aiken .....	1	2	20	No	....	No	Yes
Charlestown .....	11	67	29	No	No	Yes	Yes
Darlington .....	1	25	20	Yes	No	....	Yes
Marion .....	1	1	13	....	....	....	No
Orangeburg .....	4	4	80	No	No	Yes	Yes
Rock Hill .....	1	12	..	....	....	Yes	Yes
Spartanburg .....	1	15	15	No	No	Yes	Some
Sumter .....	1	12	10	No	No	No	No
<b>South Dakota:</b>							
Aberdeen .....	2	11	4	....	....	Yes	No
Mitchell .....	1	2	40	Yes	No	Yes	Some
Watertown .....	1	6	15	No	No	Yes	Yes
<b>Tennessee:</b>							
Chattanooga .....	8	79	..	No	No	Yes	a
Columbia .....	1	..	10	No	No	Yes	Yes
Knoxville .....	5	72	8	No	No	Yes	Yes
Park City .....	1	3	8	No	No	Yes	Yes
Pulaski .....	3	..	18	No	No	Yes	Yes
Tullahoma .....	..	..	15	....	....	....	Yes
Union City .....	1	2	7	No	....	....	....
<b>Texas:</b>							
Austin .....	9	18	664	No	No	....	Some
Beaumont .....	5	38	..	No	No	Yes	Yes
Bowie .....	1	1	15	No	..	Yes	Yes
Bryan .....	1	1	34	No	No	No	Some
Corsicana .....	2	6	100	No	No	Yes	Yes
Dallas .....	14	156	..	Yes	No	Yes	Yes
Dublin .....	1	1	..	....	....	Yes	No
El Paso .....	5	42	..	....	No	Yes	....
Fort Worth .....	13	102	..	....	No	Yes	Yes
Gainesville .....	2	4	96	No	No	Yes	No
Galveston .....	8	65	..	No	No	Yes	No
Greenville .....	3	7	28	No	No	Yes	Yes
Hillsboro .....	1	2	12	....	....	....	Yes
Houston .....	10	137	12	Yes	Yes	Yes	Yes
Houston Heights .....	..	5	..	No	No	Yes	Yes
Laredo .....	2	4	100	No	No	No	....
McKinney .....	1	2	..	No	No	No	Yes
Marlin .....	1	2	30	No	No	No	Yes
Mexia .....	1	1	18	No	No	Yes	Yes
New Braunfels .....	4	..	60	No	No	Yes	Yes
Paris .....	3	14	..	....	....	Yes	Unknown
San Antonio .....	15	130	..	Yes	No	Yes	No
San Marcos .....	1	2	75	No	No	Yes	Yes
Smithville .....	1	30	..	No	No	No	Some
Sulphur Springs .....	4	1	18	....	No	Yes	Yes
Sweetwater .....	4	16	..	No	No	No	No
Tyler .....	1	8	25	Yes	No	Yes	Yes
Vernon .....	1	..	17	No	No	Yes	Unknown
Victoria .....	4	7	..	Yes	No	Yes	Yes
<b>Utah:</b>							
Logan .....	1	2	6	....	....	Yes	Yes
Nephi .....	..	..	..	No	No	No	....
Salt Lake .....	6	85	..	Yes	No	Yes	No
Spanish Fork .....	1	..	25	....	....	Yes	Yes
Springville .....	1	..	23	No	No	Yes	Yes
<b>Vermont:</b>							
Brattleboro .....	4	3	..	....	....	....	....
Middleburg .....	2	..	30	No	No	No	Yes
Montpelier .....	1	5	30	No	No	Yes	Yes
Rutland .....	2	9	20	....	....	....	Yes
St. Albans .....	1	4	24	No	No	Yes	Yes
<b>Virginia:</b>							
Alexandria .....	3	..	160	No	No	No	No
Charlottesville .....	1	3	50	No	No	....	Yes
Danville .....	3	12	20	No	No	Yes	Unknown
Farmville .....	2	3	12	Yes	....	Yes	Yes
Harrisonburg .....	1	..	150	No	No	No	Some
Marion .....	3	..	25	No	No	No	No
Norfolk .....	9	116	..	Yes	No	Yes	No
Petersburg .....	3	38	..	Yes	No	Yes	No
Portsmouth .....	18	22	400	No	No	No	Yes
Richmond .....	14	198	..	Yes	No	Yes	Yes
Roanoke .....	6	56	4	No	No	No	Yes
Staunton .....	1	2	10	No	No	No	No
Suffolk .....	1	3	41	No	No	Yes	Yes
<b>Washington:</b>							
Anacortes .....	2	2	30	No	No	Yes	Yes
Bellingham .....	3	14	..	....	....	Yes	Yes
Centralia .....	2	7	..	....	No	Yes	Yes
Colfax .....	5	..	38	....	....	....	....
Ellensburg .....	1	4	20	No	No	....	Yes
Everett .....	3	23	..	Yes	No	Yes	Yes
Hoquiam .....	4	11	..	No	No	Yes	Yes
Olympia .....	1	6	10	No	No	Yes	Yes
Port Townsend .....	2	2	25	Yes	....	Yes	Yes
Pullman .....	..	..	16	No	No	Yes	Yes
Renton .....	1	..	60	....	....	Yes	Yes

TABLE NO. 3—GENERAL FIRE DEPARTMENT DATA.—Continued.

City.	No. of fire houses.	Number of men— Full time.	Call or volunteer.	Fire prevention squad?	Two platoon system?	Building inspection by firemen?	Will your hose couplings fit all nearby cities?
Snohomish .....	4	..	35	Yes	No	Yes	Yes
Spokane .....	14	200	..	Yes	Yes	Yes	Yes
Tacoma .....	13	132	..	No	No	Yes	Yes
Vancouver .....	1	4	17	No	No	Yes	Yes
<b>West Virginia:</b>							
Benwood .....	2	2	..	No	No	No	Yes
Charleston .....	3	25	5	No	No	Yes	No
Charlestown .....	2	..	125	No	No	....	Yes
Davis .....	..	..	..	....	....	....	Yes
Elkins .....	3	60	..	No	No	No	Yes
Fairmont .....	2	11	36	No	No	Yes	Yes
Hinton .....	5	..	48	....	....	Yes	....
Keyser .....	2	20	..	....	....	....	Yes
McMechen .....	1	..	..	No	No	....	Unknown
Mannington .....	..	25	..	....	....	....	Yes
Martinsburg .....	3	6	150	No	No	Yes	No
Princeton .....	..	21	..	....	....	....	....
Wheeling .....	9	50	..	Yes	No	Yes	Yes
Williamson .....	..	..	22	....	....	....	....
<b>Wisconsin:</b>							
Appleton .....	3	20	..	Yes	No	Yes	No
Ashland .....	3	14	17	No	No	Yes	Unknown
Baraboo .....	2	..	28	No	No	Yes	Some
Beaverdam .....	1	2	34	Yes	No	No	Unknown
Berlin .....	1	1	22	....	....	Yes	Yes
Burlington .....	..	..	45	Yes	....	Yes	Yes
Chippewa Falls .....	1	7	5	Yes	No	Yes	No
Cudahy .....	1	3	23	No	No	Yes	Yes
Eau Claire .....	4	21	..	Yes	No	Yes	No
Fort Atkinson .....	1	..	58	Yes	....	Yes	Yes
Hartford .....	1	..	80	Yes	....	Yes	Yes
Hudson .....	1	..	12	Yes	No	No	No
Janesville .....	3	15	7	Yes	No	No	No
Jefferson .....	1	..	65	....	....	Yes	Yes
Kenosha .....	3	15	..	No	No	Yes	No
La Crosse .....	5	51	..	No	No	Yes	Yes
Lake Geneva .....	2	..	40	Yes	....	Yes	Some
Manitowoc .....	2	15	2	Yes	No	Yes	Yes
Manasha .....	1	..	16	No	No	Yes	Yes
Menominee .....	2	3	25	Yes	No	Yes	Yes
Merrill .....	2	10	..	No	No	Yes	No
Milwaukee .....	35	536	..	Yes	No	Yes	No
Neenah .....	1	..	14	No	No	Yes	Some
Oshkosh .....	7	40	..	Yes	No	Yes	No
Plymouth .....	1	..	200	....	....	Yes	Yes
Portage .....	1	4	28	No	No	Yes	No
Port Washington .....	1	27	..	Yes	No	Yes	Yes
Racine .....	6	43	..	....	....	Yes	No
Reedsburg .....	1	2	30	....	....	Yes	Unknown
Rhineland .....	2	8	..	No	No	Yes	Yes
Rich Lake .....	4	..	..	Yes	No	Yes	Yes
Ripon .....	1	..	25	No	Yes	Yes	Yes
Stevens Point .....	2	11	16	Yes	No	Yes	Some
Stoughton .....	1	..	33	Yes	....	Yes	Yes
Sturgeon .....	2	3	17	Yes	No	Yes	Yes
Superior .....	7	57	3	Yes	No	Yes	Yes
Two Rivers .....	1	..	36	Yes	No	Yes	Yes
Waupaca .....	1	..	24	No	No	Yes	Unknown
Wausau .....	4	21	..	No	No	Yes	No
<b>Wyoming:</b>							
Cheyenne .....	2	16	14	Yes	No	Yes	No
Evanston .....	4	..	80	No	No	Yes	Yes
Lander .....	1	..	25	....	No	....	Yes
<b>Canada:</b>							
Brantford .....	2	21	..	No	No	Yes	Some
Hamilton, Ont. ....	5	88	..	No	No	No f	Yes
Kingston, Ont. ....	2	18	..	No	No	Yes	No
Lethbridge, Alta. ....	2	17	..	Yes	No	No	Some
London, Ont. ....	5	42	..	Yes	....	Yes	Yes
Peterborough, Ont. ....	1	16	..	No	No	Yes	No
St. Catherine, Ont. ....	8	12	25	....	....	Yes	Yes
Stratford, Ont. ....	1	8	8	....	....	Yes	Yes
Sault Ste Marie, Ont. ....	2	9	30	No	No	Yes	Yes
Vancouver, B. C. ....	15	197	..	Yes	No	Yes	Yes
Victoria, B. C. ....	8	81	..	Yes	No	Yes	Yes
Windsor, Ont. ....	3	15	10	No	No	Yes	Yes
Winnipeg, Man. ....	15	215	..	No	No	Yes	Yes

a—Use adapters.

b—Practically all.

c—And one on part time.

d—Has standard thread.

e—Will change to two-platoon system on January 1.

f—Will soon adopt building inspection.

g—By Bureau of Fire Prevention.

**MINNEAPOLIS BUILDS FIRE APPARATUS.**

Like many of the larger cities, the Minneapolis fire department maintains a repair shop for keeping all the apparatus in the best condition. Probably most of the fire department repair shops also do more or less original construction, but few, we believe, have done as much of this as the Minneapolis shop. The department now has in service 10 combination chemical and hose wagons, each carrying a 30-gallon chemical, and 7 hose wagons; also five city style hook and ladder trucks which carry Seagrave hand extension ladders, one 40 feet in length,

two 45 feet, one 54 feet and one 60 feet; all built by the department. The repair shop has also built two 50-gallon chemical engines, one with Champion tanks and turret nozzle and the other with Holloway tank. The first of these to be placed in service was the 54-foot ladder truck in December, 1889, followed in 1892 by another truck with a 60-foot ladder, a hose wagon and a hose and chemical combination. The 1892 hose wagon has a turret nozzle, as has also the second hose wagon, placed in service in July, 1893.

# Municipal Journal

Published Weekly at  
50 Union Square (Fourth Ave. and 17th St.), New York  
By Municipal Journal and Engineer, Inc.  
Telephone, 2805 Stuyvesant, New York  
Western Office 608 S. Dearborn Street, Chicago

S. W. HUME, President  
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Secretary  
C. A. DICKENS, Western Manager  
A. PRESCOTT FOLWELL, Editor

## Subscription Rates

United States and possessions, Mexico, Cuba.....\$3.00 per year  
All other countries..... 4.00 per year  
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

## CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

OCTOBER 8, 1914.

## CONTENTS

Baltimore's Fire Department. (Illustrated.).....	483
Building Inspection in Minneapolis. (Illustrated.).....	486
Fire Prevention.....	487
Fire Prevention Inspection. By Karl W. Detzer.....	488
Prevention in Various Cities.....	489
Norwich, Conn., Fire Department. (Illustrated.).....	490
Fire Apparatus in American Cities: Tables.....	491
Extinguishing Fires in Los Angeles.....	499
Wheeling Fire Department.....	508
Minneapolis Builds Fire Apparatus.....	516
Automobile Fire Apparatus.....	517
Tractors and Trailers.....	517
High or Low Duty Fire Engines.....	517
Cost of Motor and Horse-Drawn Apparatus.....	518
Savannah, Ga., Fire Department.....	519
Municipal News. (Illustrated.).....	520
Legal News—Notes of Recent Decisions.....	527
News of the Societies.....	528
Motor Fire Apparatus—New Developments and Recent Installations. (Illustrated).....	530
Industrial News. (Illustrated.).....	537
Contract News.....	538

## Automobile Fire Apparatus.

It is about ten years since automobile fire apparatus was first seriously considered in this country. Six years ago its practicability was still being denied by some fire chiefs. To-day we find that, of the six hundred cities of all sizes reporting to us on this point (which may be taken as representative of the whole country), more than ninety-nine per cent have stopped purchasing horse-drawn fire apparatus, with the object of completely motorizing their departments as soon as possible.

The manufacturers of fire apparatus have of course been largely responsible for this by studying the needs of these cities and continually improving the apparatus offered to meet them. During the first few years the apparatus generally consisted of stock chassis fitted with different styles of bodies; but now the heavier apparatus, at least, is built throughout to answer the exacting demands of fire service.

About half the cities reporting named the kinds of apparatus purchased by them during the past twelve months. The number of pieces so named totaled 459, and of these 138, or 30 per cent, were chemical and hose combinations; 75, or 16 per cent, were tractors; 49, or 11 per cent, were chiefs' cars; 45 were triple combinations; 37 were trucks; 32 were hose wagons, and the same number were pumping engines without hose or chemicals; 18 were chemicals; 15 were pumping engines with hose; 6 were aerial; there were 4

each of repair or supply wagons and of chasses, and two each of squad wagons and pumps carrying chemicals but no hose. Perhaps the most significant of these figures is the high percentage of tractors and triple combinations.

A somewhat less number of cities were able to forecast with more or less certainty the apparatus which they contemplate purchasing. Of 448 pieces so reported, 183 were combination chemical and hose, 79 were pumping engines, 72 were aerial trucks, 64 were tractors, 26 were city service trucks and 24 chiefs' cars.

## Tractors and Trailers.

With almost the earliest installation of motor fire apparatus, use of this was made from time to time by different cities for drawing hose wagons and other apparatus to the fire because of the greater speed obtainable. As a natural result of this was the development of the tractor, which is essentially the motor and traction portion of an automobile designed to be more or less permanently attached to a piece of old horse-drawn apparatus. The acceptability and usefulness of tractors is indicated by the fact that, while our tables last year showed 52 tractors in use, this year we listed 223 tractors, or more than four times as many.

An intermediate scheme has been developed in a number of cities, namely that of fitting to old horse-drawn apparatus short tongues or other form of coupling by which the old apparatus can be attached to motor apparatus owned by the department. For instance, the fire marshal of Decatur, Ill., C. W. Devore, states that their two steam fire engines, which are held in reserve, have been fitted with short tongues, and the combination motor wagon has corresponding couplings by which the steamers can be attached to them. Then, in case a steamer is needed, a motor wagon is sent to the fire station for it and brings it to the fire in less time than could be done with horses. Similar appliances are operated by several other cities, as indicated in the tables.

## High or Low Duty Fire Engines.

Purchasers of pumping engines for water works plants find available, in almost any capacity of pump, those having duties ranging from 50 million to 150 million foot pounds, and even less and greater for exceptional services. The low duty pumps have the advantage of being cheaper and also that they do not need so expert an engineer to operate them nor do they get out of order so easily by neglect or disuse. Experienced purchasers of pumping engines therefore study carefully the requirements of each case and purchase accordingly.

It might appear that for similar reasons fire departments should be able to select from pumping engines of various efficiencies. There can be no question that the most imperative need of a fire pumping engine is reliability. There must be absolute certainty that the pump will not break down or fail in any way from any cause whatsoever during an emergency; and of only little less importance is it that it shall continue hour in and hour out to deliver the full amount of water at which it is rated. The best builders of engines can now guarantee this reliability. There then arises the question as to the duty of the pump—that is, how much fuel will be required to pump the guaranteed quantity per hour or to perform a stated number of foot pounds of work. But we have here, as in the case of water works, to consider that it may not always be desirable to have a high duty pump with its attendant greater liability to loss of efficiency or to injury through neglect or infrequent operation, and the



necessity for a more experienced engineer to secure for it its full efficiency.

A report for last year from a small city stated that its auto pumping engine actually pumped six hours and forty-five minutes during the entire year, answering only eight alarms. The amount of fuel used during the year by an engine which sees no more service than this is a matter of almost no importance, as the duty or efficiency of a pumping engine purchased by a town with this small number of fires need not be considered, but entire attention paid to securing reliability and capacity. If we consider the case of a large city, we find, for instance, that each of the twenty-six engines operated by the Minneapolis fire department made from 42 to 270 runs during the year 1913, averaging 143. With one run about every third day for these engines, even though some of the fires demanded continuous pumping service for several hours, it is probable that the number of hours of actual pumping per year would not much exceed the hours pumped during one week in a water works plant; and where a water works pump is not to be operated longer than this in one year, it would not be considered economy to purchase a high efficiency pump.

It would therefore seem, from this consideration, that the efficiency of the pump, even in the largest cities, is a matter of minor consideration as compared to reliability, purchase and maintenance cost, and possibly other considerations as well.

## COST OF MOTOR AND HORSE-DRAWN APPARATUS.

### Comparative Cost of Operating and Maintaining Fire Apparatus of Both Kinds—Figures Furnished by Seventy Fire Chiefs.

Among the questions which all the fire chiefs of the country were asked to reply to, was a request for definite figures concerning the cost of maintaining and operating motor-driven apparatus as compared with horse-drawn. A considerable number of the chiefs replied, most of them giving figures only, without attempting to analyze them in any way, and in most cases without stating whether the total cost included anything for new tires or repairs to the apparatus. We assume that in the majority of cases the figures given cover actual expenditures, whatever these may have been, those for the horse-drawn apparatus being confined practically to the expense of keeping the horses—feed, shoeing, veterinary services, etc.

In some cases the motor apparatus had not been in service an entire year and the figures are for a few months only. In other cases the figures given were the average cost per month. In order to make them more readily comparable, we have reduced them all to the rate per year. Also, in order to condense the statements as much as possible, we will give in the case of each city the cost of the horse-drawn apparatus first, followed by that of the motor apparatus, unless otherwise stated. A few cities gave this information more in detail, and these complete statements will be given at the end of the article. In the description of Baltimore's fire department, the leading article in this issue, will be found a statement of costs for that department.

Birmingham, Ala., team, \$400; wagon, \$250.

Alameda, Cal., engine, \$650; engine, \$49.40.

Modesto, Cal., hose wagon, \$306.30; combination, \$123.35.

San Rafael, Cal., hose wagon, \$540; hose wagon, \$30.

Santa Cruz, Cal., truck, \$244.86; truck, \$147.50.

Santa Monica, Cal., gas, oil and charging batteries for motor combination, \$54.

Boulder, Colo., hose, \$480; combination, \$60.

Colorado Springs, Colo., combination, \$168; combination, \$60.

Trinidad, Colo., truck, \$720; truck, \$240.

New Britain, Conn., combination, \$384; combination, \$25.14.

Albany, Ga., pair of horses, \$400; combination, \$45.

Dixon, Ill., pair of horses, \$360; truck, \$42.

Sterling, Ill., combination, \$800; combination, \$50.

Waukegan, Ill., combination, \$525; combination, \$34.80.

Richmond, Ind., \$292; \$109.50.

Terre Haute, Ind., combination, \$346.35; combination (including new tires), \$100.55. (Motor made twenty-nine more runs than horse apparatus in four years.)

Davenport, Ia., per horse, \$128.86; \$270.58.

Iowa City, Ia., \$281.85; combination, \$26.27.

Atchison, Kan., five horses, \$1,080; two pieces of apparatus replacing same, \$240.

Maynard, Mass., truck, \$360; combination, \$40.

Watertown, Mass., hose, \$380.72; hose, \$91.91.

Lansing, Mich., seventeen horses, \$3,840; seven pieces of apparatus taking their place, \$1,481.37.

Niles, Mich., truck, \$199.62; combination, \$6.95.

Jackson, Miss., 2 engines, 2 combinations, 1 hose, \$1-617; chief's car, combination and aerial, \$491.

Carthage, Mo., combination, \$270; combination, \$54.

Sedalia, Mo., combination, \$330; combination, \$216.

Bozeman, Mont., \$408; \$40.94.

Lewistown, Mont., \$320; \$48.

Missoula, Mont., \$264; \$63.

East Orange, N. J., 7 horses, \$476.16; three cars replacing same, \$185.40.

Paterson, N. J., \$597.33; \$141.24.

Amsterdam, N. Y., \$312; \$30.

Alliance, O., \$420; \$42.

Circleville, O., hose, \$175; engine, \$60.

Hamilton, O., \$244; \$56.

Lorain, O., 2-horse hose, 3-horse aerial, \$1,047.55; combination and aerial, \$131.40.

Portsmouth, O., \$1,550; \$150.

Butler, Pa., \$200; \$60.

Scranton, Pa., 7 horses, \$1,098.30; 4 motor cars replacing same, \$171.51.

Warren, Pa., \$336; combination, \$30.

Park City, Tenn., \$720; \$22.50.

El Paso, Tex., \$360; \$60 to \$85.

Roanoke, Va., 7 horses, \$2,455.20; 3 motor cars replacing same, \$1,415.95.

Anacortes, Wash., \$420; \$30.

Centralia, Wash., \$420; \$60.

Ellensburg, Wash., \$500; \$53.

Everett, Wash., hose wagon, \$624; combination, \$144.

Hoquiam, Wash., \$408; \$72.

Eau Claire, Wis., \$300; \$60.

Merrill, Wis., \$192; \$36.

Racine, Wis., \$360; \$60.

Cheyenne, Wyo., \$336; truck, \$60. Chief's horse and buggy, \$158.40; chief's auto, \$39.

Jackson, Miss., 5 pieces, \$1,617.96; 3 pieces, \$655.04.

Carthage, Mo., \$270; \$54.

Sedalia, Mo., \$330; chemical, \$216.

Waukegan, Ill., \$525; \$34.80.

Meridian, Miss., \$360; \$60 to \$84.

Stamford, Conn., reports that the operation of two fire stations from January 1 to September 1, 1914, including tires, gasoline, oil, repairs, feed, medicine and horseshoeing, was \$695 for one house containing three motors and one 3-horse truck; and \$760 for the other house containing three horse-drawn machines.

Stratford, Conn., reports \$300 as the cost of maintaining an auto chemical with ladders.

Highland Park, Ill., in nine months of operation of

a combination paid \$27.25 for 150 gallons of gasoline, \$5.04 for 18 gallons of oil and \$1.25 for battery, etc.

In Seymour, Ind., it cost \$300 a year to maintain one team, and in Winfield, Kan., \$271.73.

In Hastings, Mich., a horse-drawn hose cost \$288.

Pontiac, Mich., reports that its motor cars save them \$30.46 per month each.

Conneaut, O., reports the cost of motor apparatus at \$2.48 per month for nine months.

At Martinsburg, W. Va., two horses cost \$270 for maintenance.

Tacoma, Washington, reports the following costs and performance:

Motor propelled pumping engine versus horse drawn steamer.

*Motor Pumping Engine:*

Cost of maintenance for three months.....	\$71.82
Miles traveled .....	29
Number of alarms.....	22
Cost per mile .....	\$2.47

*Horse-Drawn Steamer:*

Cost of maintenance for three months.....	\$180.00
Miles traveled .....	23
Number of alarms .....	13
Cost per mile.....	\$7.80

Horst drawn chemical versus motor combination hose and chemical:

*Horse:*

Cost of maintenance of one year.....	\$465.00
Number of miles traveled.....	100
Cost per mile.....	\$4.65

*Motor:*

Cost of maintenance for one year.....	\$152.48
Number of miles traveled.....	163
Cost per mile .....	\$0.93

The following is sent by Chief Ringer of Minneapolis:

**Comparative Table of Motorized and Horse Drawn Apparatus in 1913.**

*Ahrens Engine No. 499—Horse drawn.*

Repairs—Labor .....	\$68.50
—Material .....	21.23
	\$89.73
Oil .....	1.52
Supplies .....	3.22
Harness repairs .....	2.45
Driver—per mo., \$96.....	1,152.00
Engineer—per month, \$108.....	1,296.00
Stoker—per month, \$99.....	1,188.00
Oats—12 qts. day, 4 horses, \$1.36 per bu....	194.40
Hay—10 lbs. day, 4 horses, \$9 per ton....	64.80
Straw—8 lbs. day, 4 horses, \$6.50 per ton..	37.44
Shoeing, 4 horses, \$20 each.....	80.00
	\$4,109.56

*Hose Wagon No. 7—Horse drawn.*

Repairs, \$12.56 .....	\$12.56
Driver—per mo., \$96.....	1,152.00
Oats—12 qts. day, 2 horses, \$.36 bu.....	97.20
Hay—10 lbs. day, 2 horses, \$9 ton.....	32.40
Straw—8 lbs. day, 2 horses, \$6.50.....	18.72
Shoeing, 2 horses, \$20 each.....	40.00
	1,352.88

Total, horse drawn apparatus.....\$5,462.44

(Note No. 909—Auto Com. Hose, Chemical and Pump.)

Repairs—Labor .....	\$100.50
—Material .....	66.80
	\$167.30
Supplies .....	31.86
Tools .....	5.26
Chemicals .....	5.52
Gas and oil .....	101.23
Driver and engineer—1 man—\$96 per mo....	1,152.00

Total, motor apparatus .....

Difference in favor of motor apparatus.....\$3,999.27

Chicago, Ill., has all its repairing done by the superintendent of machinery at the department's repair shop. During 1913 the cost of repairs to apparatus was as follows: Average of 20 auto hose wagons, \$56.87 for material and \$55.59 for labor. Average of 2 auto engines, \$37.15 for material and \$115.05 for labor. Average of 119 horse-drawn engines, \$97.91 for material and

\$127.43 for labor. Average of 8 chiefs' autos, \$84.27 for material and \$346.04 for labor. Average of 30 chiefs' buggies, \$33.14 for material and \$73.96 for labor. Average of 34 horse-drawn hook and ladder trucks, \$104.47 for material and \$183.20 for labor. Of the horse-drawn engines, 13 were given a general overhauling, 46 received minor repairs and 5 were painted. Of the trucks, 5 were given a general overhauling, 7 received minor repairs and 8 were painted. Also 3 engines received new boilers.

**SAVANNAH, GA., FIRE DEPARTMENT.**

One disastrous fire early in 1913, causing a loss of nearly three-quarters of a million dollars, made the average percentage of fire loss for the year much higher than usual. The total loss sustained was \$942,243.75, 5.8 per cent. of the property involved.

A fire committee, composed of W. A. Pigman, W. J. Pierpont, W. W. Williamson, J. E. Foy and H. B. Grimshaw, are at the head of the department, which consists of Chief Engineer John H. Monroe, First Assistant Chief A. J. Loshack, one second assistant chief, one secretary, one electrical inspector, one fire alarm superintendent, one superintendent of machinery, one assistant, one chief fire inspector, four fire inspectors, three chauffeurs, nine captains, nine lieutenants, six engineers, five tillermen, five drivers and fifty privates.

Practically all the fire apparatus is motor driven. There are 7 La France type, 12 100 h. p. pumpers, 4 La France type, 10 48 h. p. combination chemical and hose wagons, one La France type, 10 48 h. p. triple tank chemical engines, one 75-ft. aerial, one 55-ft. aerial, one truck with chemical tank, 2 city service trucks with chemical tank, 3 supply wagons, 2 chiefs' cars and 2 buggies in service. In reserve there are 2 first size double pump stream engines, one double extra first size double pump engine, one double tank chemical engine and one wood frame tiller truck. This apparatus is housed in 9 fire houses.

During the year there were 399 alarms received by the department, 34 of which were false. There were 319 fires confined to the place of origin and only 4 of the 219 occurring in wooden buildings spread to adjoining property. At the various fires 170,900 feet of fire hose was laid, 7,539 gallons of chemicals used and 1,389 feet of ladders raised.

The electrical inspector, in charge of that branch of fire prevention work, made 27,184 inspections, held 24 examinations for moving picture operators and 3 for house electricians. Nine hundred and eighty-seven defects in electrical wiring were located and corrected and 89 places were wired in conduit.

The fire inspector and his assistants made 29,628 inspections during the year. This department has charge of all gasoline storage and grants permits for the sale and storage of explosives, inflammable oils, etc. Theaters and motion picture houses were rigidly inspected.

Twenty-five certificates were granted by the Board of Electric Examiners, 40 examinations being held. The board, acting in an instructive capacity, has done much to raise the standard of electric wiring, construction and repairs in Savannah. Working in conjunction with the electrical inspectors bureau, the department has done much to reduce the fire hazard in the city.

A few years ago the department started a repair shop. The beginning was a very small one and space was taken up in one of the fire houses. Since then, however, the saving by this branch of the service has been so great that it is now housed in a separate building. A more complete account appeared in Municipal Journal about two years ago.



## The WEEK'S NEWS

Extensive Road Work in Baltimore, Md.—The Pacific Highway.—Concrete Viaducts of Chattanooga, Tenn.—Improvements in Niagara Falls, N. Y.—Health Commission for Colorado.—Water Famine.—Municipal Water-Works in Canada.—Lighting in California Cities.—Fires in Salem and New York.—New Auto Apparatus.—Street Cleaning Exhibit in New York.—Boston Subway and San Francisco Trolleys.

### ROADS AND PAVEMENTS

#### Mile-a-Day Baltimore Road Work.

Baltimore, Md.—According to a report tendered the Mayor by the Commissioners for Opening Streets, that department believes that it has broken all previous records in any city or city department in the country and established a new mark in the laying of improved pavements. At the rate of nearly a mile a day the links of new good roads, which will give Baltimore connection with every county seat on the Eastern Shore, are being rushed to completion by the State Roads Commission. The report states that the Department in one day placed 6,053 square yards of topping, 3,469 square yards of binder and 500 square yards of vitrified brick paving, making a total of 6,553 square yards of finished surface and 10,022 square yards of material laid. On another, the report continues, 8,428 square yards of binder and 2,146 square yards of sheet asphalt topping, besides 500 square yards of brick work, were laid. A tour of inspection by Chairman O. E. Weller and Chief Engineer Henry G. Shirley shows that the contractors are pushing their forces to the limit in order to complete their work before they are stopped by cold weather. Unless all calculations go wrong, Baltimore will by December 1st be connected with Belair, Havre de Grace, Perryville, Elkton, Chesapeake City, Chestertown, Centerville, Easton, Denton, Cambridge, Hurlock, Preston, Sharptown, Salisbury, Princess Anne, Berlin, Snow Hill and Pocomoke City. This will give a modern, high-class highway more than two hundred and fifty miles in length. The longest stretch of concrete road in the state will be that between Salisbury and Ocean City, a distance of 30 miles, with few curves and the whole stretch perfectly level.

#### Free Stone for Roads.

Chicago, Ill.—That the thousands of tons of stone in the spoil banks of the drainage canal may be used for road building has been announced by A. D. Gash, president of the Illinois Highway Commission. The only serious obstacle to the use of the stone is lack of cheap transportation between Joliet and Chicago and the townships downstate where the roads are being built. The only expense incurred is the freight and the cost of handling. The railroads for a time allowed a rate of 50 cents a ton for material used in road building. They have now raised it to 95 cents a ton, and the Highway Commission protested to the State Public Utilities Commission.

#### To Fight Traction Engine Road Damage.

Hagerstown, Md.—Chairman Weller of the State Roads Commission announced that an appeal will be taken upon the decision of the Frederick County Circuit Court in refusing to refrain certain traction engine owners from running their machines over improved highways. The Roads Commission has made it plain that it does not wish to prevent the traction engines from using the roads. But for the sake of the road system, the Commission contends that the state law against machines equipped with cleats or other devices that will cause damage to the road surface should be enforced, the regulation being a reasonable one, they claim. The traction engines are meanwhile running upon the various roads. It was generally claimed that it would be impracticable to require the traction engines to use filler blocks on the wheels and the Court so intimated although it did not express a direct opinion on the question. Mr. Weller says, however, that he has offered at the trial to fit any traction

engine in the county with the blocks and to take it over any state road in the county drawing its threshing machine, and if it failed to go over the roads to withdraw the case. But this offer was refused.

#### No State Aid for City Road.

Johnstown, Pa.—There will be no state aid for at least 1,600 feet of the proposed Kernville-Southmont road which was asked of Highway Commissioner E. M. Bigelow. That much of the road will be within the city limits and so it is barred. The Commissioner was not certain whether he could use state highway funds to help in the building of a road in the city. Mr. Bigelow investigated the legality of the proposition and found that no aid can be given a city. State aid can be secured on all the rest of this proposed road and state engineers will be sent by the Commissioner to survey the line.

#### Cost of Pacific Highway Section.

Eugene, Ore.—The total cost of the 2.13 miles of the macadam road on the Pacific highway between West Springfield and the village of Goshen, completed a short time ago, was \$12,291.28, according to the figures reported by H. W. Libby, county engineer. This makes the cost per mile \$5,770.55. According to the figures, the cost of the grading was \$4,902.30; tools and supplies, \$244.84; sprinkling, \$446.90; spreading rock, \$440.20; rolling, \$322.90; hauling, \$2,106.60; total for this class of work, \$8,463.74. The crusher department cost as follows: Crusher labor, \$3,347.25; supplies, \$480.29; total, \$3,827.54, making a grand total of \$12,291.28. From the crusher at Goshen 5,000 cubic yards of rock were taken and 386 yards were bought, making a total of 5,386 cubic yards used on the road. The cost of the rock was 71 cents per cubic yard and the cost of hauling it was 39 cents per cubic yard, or 26 cents per yard mile. The county built this stretch of road itself under the direction of Road Superintendent McKy, and it is figured that it can be done more cheaply under this system than by letting the work out by contract.

#### Concrete Viaducts in Chattanooga

Chattanooga, Tenn.—Almost simultaneously with the completion of the McCallie avenue viaduct, toward which expense the city agreed to pay \$20,000 to hasten the work, the Supreme Court of Tennessee handed down a decision that the railroads themselves should build viaducts where needed. The new concrete structure, the largest and best of its kind in the city, was opened to street car travel on December 9. The decision does not affect the city's agreement to pay the \$20,000 towards the expense of the viaduct. As a result of the decision it now seems that other badly needed viaducts will reasonably soon be erected. A frame and uncovered steel viaduct preceded the new one at McCallie avenue. Fumes from passing engines affected the old structure, which also proved entirely inadequate to the demands upon it, there being a double track street car line besides facilities for vehicle traffic and foot passengers. The new structure is thoroughly modern. Its cost is about \$100,000, met by the two railroads, with the exception of \$20,000 by the city and some \$8,000 by the street railway company. Work on the McCallie avenue viaduct began April 18, last, the Chickamauga Quarry & Construction Co. having the contract let by the railroads after plans and specifications were passed on by their engineers and the city engineer jointly. Approximately 10,000 tons of concrete went into the viaduct, which is 735.5 feet long, made up of 21 spans. In width it is 60 feet, di-



vided as follows: Roadway, 40 feet; sidewalk on each side, 10 feet. There is 12 feet of clear vehicle roadway between the outer car rail and curb on each side.

The entire roadway is brick. Ornamental posts, with trolley wire and lights, are placed on each side of the structure, being fastened in openings provided in the extended ends of spans. These posts are of the standard type used by railway companies. Each is made up of three sections, one 7 inches in diameter, another 6 inches, and the third 5 inches. Each post terminates in a spiral, from which is suspended one 108-watt mazda lamp. There are fourteen of these posts, seven on each side. The viaduct posts were furnished to the railway company by the National Tube Co., of Pittsburgh. The viaduct is all flat span work. The working force averaged eighty men, and the payroll was about \$1,000 a week. The contracting firm is the first in this section to use chutes for depositing concrete in place, and this method explains the quick time in which the viaduct was completed with a comparatively small force. The pilasters and hand rails were set in place. Two towers, made by the Insley Manufacturing Co., Indianapolis, were used in depositing concrete for the main work, one being placed on either side of the tracks. Material for the pilasters and hand rail was mixed and placed by hand. The 500 tons of twisted steel used for reinforcement, varying from  $\frac{1}{4}$  inch to  $1\frac{1}{2}$  inches, was furnished by the Corrugated Bar Co., Buffalo, N. Y. Ten thousand barrels of Royal Portland cement, made by the Dixie Portland Cement Co., went into the viaduct. The grade of the viaduct is 5.3 per cent. on the eastern approach, and 5.5 per cent. on the western approach. Work is now in progress on the East End avenue viaduct, which is being built by the railroads. It will cost about the same as the other viaduct and the construction will be similar. Both viaducts are shown in the illustrations—the completed one and the concrete distributing system of the other.

#### \$500,000 Improvements for Niagara Falls.

Niagara Falls, N. Y.—More than half a million dollars for public improvements in six months, is the amount this city is spending on pavements, sidewalks, sewers and water mains. Of this more than one-half is being spent for new pavements. For the most part the improvements are being made in the outlying sections of the city—on the east side and at the far north end. The city now has about 50 miles of pavements, 90 miles of sewers and 70 miles of water mains. Contracts were awarded this year for the laying of 96,304 square yards of pavements, 21,070 feet of sewers and 49,860 feet of water mains. Most of the work will be completed within six weeks. The new pavements contracted for this year will cost the city \$289,230. The biggest paving contract of the year is that awarded to the Read-Coddington Engineering Company for the laying of a brick pavement in Buffalo avenue, at an estimated cost of \$81,650. The base will be eight inches thick, the Niagara Falls Power Company paying for the extra two inches of concrete so as to make

the road more permanent. Only a portion of this pavement will be laid this year. Contracts for about  $9\frac{1}{2}$  miles of water mains costing \$46,531 were awarded to Shepard and Callahan by the water board three months ago.

## SEWERAGE AND SANITATION

### Complete Vital Statistics for Florida.

Tallahassee, Fla.—The opportunity is now offered to every incorporated city and town in Florida to inaugurate and maintain a complete and permanent record of the births and deaths of its inhabitants and to provide an accurate index of its health conditions. This was possible before only in those cities of from 1,000 to 2,000 population. The facilities will be given all places on condition that they pass ordinances requiring birth and death certificates upon standard forms under the control of the municipality. To assist each municipality to inaugurate this plan the state board of health will pay local registrars who fulfill their duties 25 cents for each certificate of birth and death properly filled out and promptly transmitted to this office, provided reports of deaths are 90 per cent accurate. A model ordinance, covering the points above outlined, has been prepared and will be furnished each municipality in the state, and each will when ready be supplied with all necessary blanks, instructions and literature explaining the needs and uses of vital statistics.

### Urge Colorado Health Commission.

Boulder, Colo.—Dr. O. M. Gilbert, of Boulder, president of the Colorado Medical Society, has instituted an active campaign in the interest of a new state law creating a department of public health and the next legislature will probably be asked to take notice of the demand for the commission. Dr. Gilbert said that the state would gain by repealing about two-thirds of the laws with reference to medical and health affairs and creating a health commission, which could deal with many of the matters which are now touched inefficiently by special acts.

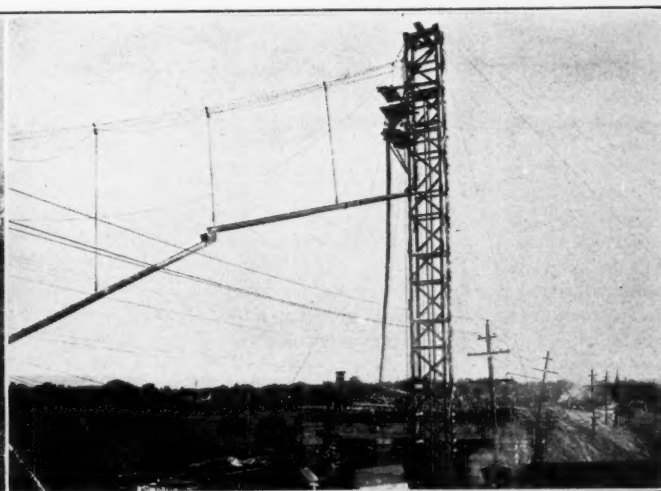
### Pollution Tested by State.

Bridgeport, Conn.—With the object of getting definite information as to the river and harbor pollution in the state of Connecticut from the presence of sewage or other impurities, and with the idea of a report to the Legislature by the State Board of Health, R. C. Meeker, of the State Board of Health, has been in this city taking samples of the water from the Pequonnock river and the harbor. These samples were sent to the state laboratory at Middletown, where Professor Henry W. Conn, state bacteriologist, makes the analyses. The outcome of the final test at the laboratory is of much importance, since it concerns the health of the cities and towns along the various streams and also of those who live by catching fish or dredging for oysters. The entire fishing and oyster business is concerned.



Courtesy Municipal Record, Chattanooga, Tenn.

McCALLIE AVENUE VIADUCT, COMPLETED.



CONCRETE DISTRIBUTING ON EAST END AVENUE VIADUCT.

## WATER SUPPLY

### Water Famine Still Reigns.

Lima, O.—Lima is temporarily saved from being without a water supply by the Solar Refining Co. offering about 30 million gallons from storage and 2,750,000 daily from its regular supply free of charge. The big reservoir is drained dry. The city supply is shut off each night from 8 p. m. till 4 a. m. The chamber of commerce urged an additional bond issue of \$25,000 in addition to the \$50,000 already issued. The city council has been in special session to provide relief measures. It has been announced by the water committee of the City Council, composed of Bayly, Keville and Dempster, Service Director Askins and City Solicitor Jackson, that the committee will at once thoroughly investigate as to what wells may be drilled, or what other means of supply obtained, will estimate the cost of obtaining such supply, and go before the City Council with a request for more money as needed. Meanwhile Service Director Askins will push the explorations for water in the west gravel deposit as rapidly as possible. The \$9,000 already provided by the City Council was appropriated in part to conduct this experiment.

New Brunswick, N. J.—Manufacturing plants are saving this town from drinking water famine and fire peril. The water supply of New Brunswick is in such shape that there is every possibility that a few days will find the faucets of the city dry. The pumps of the city are insufficient to supply the needs of even the most thinly populated ward. Strenuous efforts have been made by Superintendent Stahlin to postpone the famine, which is inevitable if rain does not soon arrive in great volume.

Coatesville, Pa.—Because of the drought, Coatesville is buying 450,000 gallons of water daily at 17½ cents a thousand from the Pennsylvania Railroad.

Gloucester City, N. J.—The officials of the water works have found it necessary to open the valves leading to Newton Creek and use creek water. President Miner, of the Board of Health, at once issued notice to residents to boil the city water before using.

### To Eliminate Electrolysis.

Atlanta, Ga.—The Georgia Railway & Power Co. has signified its willingness to install a system of electrolytic mitigation which will prevent injury to the water pipes and other conduits of the city, which are said to have suffered to the extent of several thousand dollars each year through electrolysis. An agreement between the city and the power company will be signed by the officers of both parties. City Electrician R. C. Turner, who first brought up the matter more than a year ago, estimates that the cost to the company of the installation of the system will be between \$60,000 and \$100,000.

### Municipal Water Works in Canada.

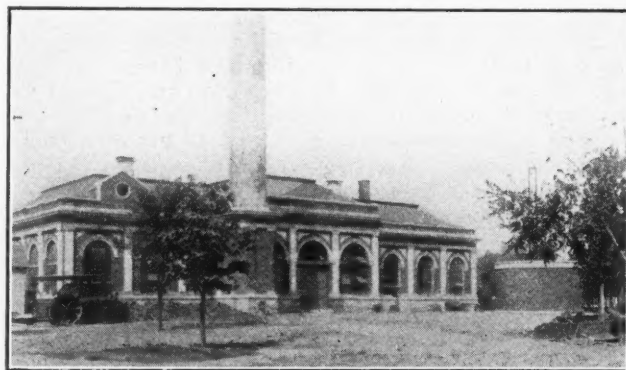
Ottawa, Canada.—There is a strong sentiment in Ontario in favor of the ownership of public utilities. Already a considerable number of cities own some or all of their public utilities, and these are generally well managed. According to figures compiled by the Dominion Conservation Commission at Ottawa the total amount invested in municipal water works in Canada is \$95,566,496, of which \$37,813,147, or 39.5 per cent, is invested in works in Ontario; the total cost of maintenance, exclusive of interest, is \$3,435,199, of which \$1,601,077, or 46.6 per cent, is borne by municipalities in this Province. Of the total length of the mains, which is 5,215 miles, Ontario has 2,182 miles, or 41.6 per cent. The cost of water varies from 7 cents per 1,000 gallons in Nova Scotia to 23 cents in Saskatchewan, the average cost in Canada being about 10 cents and in Ontario 9.6 cents per 1,000 gallons. The cost per capita, which varies from \$2.87 in Prince Edward Island to \$6.27 in Alberta, averages for the Dominion \$4.12 and for Ontario \$4.21. The average daily consumption per capita for Canada is 113 imperial gallons and for Ontario 120 gallons.

### Instal Chlorine Purification.

Shelton, Conn.—Among other improvements recently made by the Shelton Water Co. is the installation of one of the new chlorine purification plants, near the distributing reservoir of the company's system. This plant has been constructed under the supervision of State Chemist James Newlands of Hartford and is the eighth one of its type in operation in this state, New Haven, Stamford and Torrington each having one, while Waterbury has three. The method used is to force a certain amount of chlorine into the distributing mains of the company, under heavy pressure, regulated by the flow of the water and the daily consumption. That the purifier does its work is shown by experiments made and the water drawn from hydrants, a mile or more from the purifier, shows a removal of about 90 per cent of the bacteria, found in water of the reservoir, prior to its passing through the plant.

### New Pumping Station Opened.

South Bend, Ind.—Mayor Fred W. Keller and a number of former city officials spoke on the occasion of the opening of the new works pumping station. The station was built at a cost of \$250,000, making the complete equipment



Courtesy South Bend (Ind.) Tribune.

SOUTH BEND'S NEW PUMPING STATION.

of the South Bend system \$1,250,000 in value. The water supply was explained to the visitors from the time the water gets into the wells in Leeper Park to the spigot. The accompanying illustration shows the rear view of the new station.

### Educate Public on Meters.

Wilmington, Del.—Two circulars are being distributed by the water department for the benefit of persons in whose houses meters have been installed. The circulars illustrate the different size leaks and tell how much water is wasted through the leaks and what it costs the city. The circular states that since the introduction of filtered water deaths from typhoid in Wilmington have decreased from 53 to 7 per cent. The department believes that the only real way for economy is to meter the entire city and they are showing the public their reasons for doing so.

## STREET LIGHTING AND POWER

### Ornamental Lighting in California Cities.

Pomona, Cal.—Mayor W. A. Vandergrift of this city is urging the installation of ornamental lighting. He has made an investigation of conditions in other California towns and his information proves his contentions that Pomona could have ornamental lighting at a less cost than it now pays for unornamental lights. He found that Redlands has six lights to the block in the business section and with three lights on each post the total cost for the six posts is only \$5.10 per month. The post is plain but neat with two 60-watt lamps on the side arms and a 100-watt lamp on the top. The side lights go out at midnight, while the 100-watt light in the center burns all night. The official reports show that the cost of maintenance is 85 cents per post and per property front foot the cost of installation was only 98 cents. Mayor Vandegrift states that the city of Pomona at the present time is paying



\$5.50 to light one block with absolutely no ornamentation. Alhambra has five light posts in each block in the business district and three light posts to a block in the residence district, and burns only 25-watt lamps. Posts are set 100 feet apart in business district and 200 feet staggered in residence section. Cost to install, \$90 per post or about \$18 for a fifty-foot lot. These lights are so connected that they can use any number they desire. They burn all lights until 10 o'clock and then turn out all but one light, which burns all night. Covina is installing its system under the 1911 street lighting act. It is using a one-light post, 100-watt lamp. Cost of installing, 60 cents per front foot of property. The cost of lighting from sunset to 11 o'clock is 5½ cents per kilowatt, from 11 o'clock until 5 o'clock, 4 cents per kilowatt. Cost per post per month about \$1.20. Officials say 100-watt lamp are not necessary and are using 60-watt lamp when renewals are made. Glendora has 210 one-light posts equipped with 100-watt lamps. It pays a minimum price of \$100 per month and has never exceeded the minimum. This makes the cost per post per month less than 50 cents. Posts are placed 100 feet apart and cost 63 cents per property front foot to install the same. All lights are turned off at 11 o'clock except corner posts, which burn all night. The rate is 6 cents per kilowatt.

#### Big Light Company Seeks Bankruptcy.

New York, N. Y.—A voluntary petition in bankruptcy has been filed in the Federal District Court against the Atlantic Gas & Electric Co., a corporation under the laws of Connecticut, with offices in this city. The petition gives assets of \$20,000 and liabilities of \$2,478,212. The company, which is capitalized at \$12,500,000 through its subsidiary and affiliated companies, generates and distributes electric light, power and gas in various communities in New York, eastern Pennsylvania and northern New Jersey. Although the assets are listed as only \$20,000, the petition goes on to say that the company has in its possession stock, bond and note claims against its subsidiaries to the face value of \$5,238,000, the actual value of which is unknown. In addition, the petition continues, the bankrupt company retains in its treasury its own common stock to the face value of \$460,000.

#### Municipal Plant Enjoined.

Massillon, O.—The Massillon Electric & Gas Co. scored on the village of Orrville when the court of appeals at Wooster made permanent temporary injunctions to restrain the village and village officials from selling bonds to raise money or spending money for an electric light plant or completing a plant already begun. By special permission the village may carry the case to the supreme court. After the local company had built a line to Orrville at a cost of approximately \$30,000 and secured many consumers of current, the Orrville Council called an election by which later \$41,000 worth of bonds were ordered issued to build a municipal electric plant and still later \$13,000 additional bonds were issued. In March the local company began its suits for injunctions to stop the work. After the temporary restraining order had been granted the common pleas court of Wayne County refused to grant an injunction and while the company was preparing its appeal to the court of appeals, it is said the Orrville officials paid \$21,000 to contractors for the new municipal plant. The court of appeals in addition to making the injunction permanent fined each of the members of the Orrville board of public affairs \$25 for contempt of court in letting contracts for the erection of the plant. A motion has been filed to assess the costs of the case against Orrville.

#### Light Rate Decisions in New Jersey.

Trenton, N. J.—The State Board of Public Utility Commissioners allowed an order permitting the New Egypt Heat, Light, Power & Water Company to readjust its rates for electric service. The company ordered a readjustment of its rates to take effect in May last, but the Board held up this schedule, and in the order slight reductions are made. Although the schedule of the company was lowered, it is higher than the old rate, as the Board says that the company is but three years old and is still in the development stage. Upon the ground that a gas company is entitled, in addition to the charge for gas, to collect an

additional sum for installing and removing the service pipe in temporary homes in summer resorts, the Board handed down a decision partly favoring a proposed amendment to the rates of the Standard Gas Company, of Monmouth county. The proposed new rates were to apply to Keansburg and Raritan Townships, Monmouth county, to sections populated largely by summer tenants. The advanced rates were to apply to tents, small bungalows or other portable buildings. The proposed new rule of the company was that every meter set for a tent, portable house or temporary shack and each extra meter required for temporary summer apartments of three rooms or less must pay a yearly charge of \$5 in addition to the regular charge for gas.

## FIRE AND POLICE

### Statewide Fire Prevention Day.

Albany, N. Y.—New York State's first "Fire Prevention Day" has been officially designated. In recognition of the need for a more extended knowledge of the few minor precautions that may succeed in reducing the state's annual fire loss of more than \$24,000,000, Governor Glynn has designated Friday, October 9. The Governor's proclamation is supplemented by a list of requests to the public from State Fire Marshal Thomas J. Ahearn. The requests include suggestions that the state's first "Fire Prevention Day" can be made practical through a general cleaning up and removal of all debris, rubbish and inflammable material, the placing of chimneys in proper condition for winter use. Inspection of public and private institutions, theatres and the like, is also suggested and it is asked that fire drills and a campaign of education with regard to fire prevention work be made a part of the day everywhere.

### Cost of Two-Platoon System.

Lynn, Mass.—During the present agitation on the part of the Lynn firemen for a two-platoon system, authentic figures on the cost of the double platoon for the Fire Department should it become operative in Lynn have been given out by Finance Commissioner Frank A. Turnbull. In discussions hitherto the figures representing the cost of the movement by the city have varied from \$40,000 to \$90,000. Commissioner Turnbull states that the minimum cost would be \$60,400 additional each year. The plan, as outlined to the commissioners by the firemen's committee, provides for 10 and 14-hour shifts, changing on the fourth day, with no days off and no meal hours; men to be allowed to sleep at the houses. Eliminating the chief, who would be on duty at all times except at his own pleasure, it would require a deputy chief, two assistant chiefs, eight lieutenants and 42 men. This would seem to just hold the department normal as to officers and men. Therefore, for the second shift, the cost for one deputy and two assistant chiefs would be \$4,600. Eight lieutenants would come to \$9,600. There are 70 men. At present 14 of these men are off every day, leaving 56 on duty. These 14 men returning because of the doing away of the days off, it would require 42 men to maintain the present efficiency and 42 new men would cost \$46,200. By adding the cost of the officers, the total minimum cost would be \$60,400. This amount would increase the tax rate \$0.67 on the present valuation or require \$3,000,000 to be added to the present valuation in order to hold the tax rate stationary.

### Water Wall Saves Tenement Block.

New York, N. Y.—The Fire Department had for two hours the hardest work of its recent history to keep within bounds a fire which destroyed a six-story brick stable. Fifty horses perished in the flames. Five alarms were sent in, and at one time Deputy Chief Hayes, in command, seriously considered calling in still more apparatus. At one time fire lines from twenty-six engines played upon the burning stable, including three fire boats. The stable was located in one of the upper East Side's most thickly populated blocks. Chief Kenlon arrived with the third alarm and took command, and Commissioner Robert Adamson hurried up from headquarters in the Municipal Building. They spread the word among the battalion chiefs that the annex back of the brick stable was one of the worst



fire traps in the city, as it had been for years a storage place for broken and worn out wagons. Not only were its three floors piled full of old wagons, but stacks of wagon wheels and broken parts were piled upon the roof. The command was to "make a wall of water" around this big tinder box and let it go, while saving the tenement houses whose walls backed up against it on all four sides. The battalion chiefs hurried lines of hose through every tenement basement and over every roof. They gained places of vantage ahead of the fire, and as the flames ate down into the piles of wagons and mounted skyward, the fire streams were at work from all sides. The screen of water between the tenements and the burning tinder box poured down for an hour, while other equipment was used to fight the fire itself. After an hour the tenement windows began to crack and cornices to smoke. Chief Kenlon for some time feared that he was in for the biggest fire since the Equitable Building burned. Finally the big torch in the middle of the block began to show signs of yielding to the deluge of water and there was a general rush to congratulate Deputy Chief Hayes.

#### Another Salem Fire.

Salem, Mass.—Salem had another bad fire when two units in what remained of the stricken city's factory colony were destroyed by a blaze for which a general alarm was given and which caused a loss estimated at \$40,000. Flying embers set fire to the roofs of ten houses, while clouds of smoke rolled over the city from the burning factories. The fire was discovered in the lower part of a four-story wooden building used as a sheepskin factory, but a stone's throw from the point where the big fire started, in the Boston street leather district. Several things favored the firemen. The city now has additional apparatus, including the new powerful Robinson motor pumping engine; on a number of streets, particularly in this district, the old cement-lined water pipes of small dimensions have been replaced with larger iron pipe which affords much greater water pressure. The men were able to attack the fire from practically all sides and, as there was practically no wind blowing at the time, they were soon able to get the blaze under control while chemical lines and hydrant pressure took care of the roof fires in the houses.

#### Firemen to Do Weaving.

Brazil, Ind.—Weary of card games to while away the time between the fires which happen about twice a month in this town, the firemen have constructed a huge loom and will weave shawls, table runners and rugs. The loom is of their own design and is very simple.

### MOTOR VEHICLES

#### New Motor Fire Engine Arrives.

Dallas, Tex.—The big auto fire engine bought by the city four months ago has arrived in Dallas and is now at Central Fire Station awaiting orders from the City Commission to test it out. According to Chief Magee, the pump has a capacity of 1,400 gallons per minute. The truck, engine and pump were made on a special order. The complete outfit cost \$9,500 at the factory of the American-La France Co., in Elmira, N. Y. It arrived in Dallas in perfect order and was run out of the car and to Central Station on its own power.

#### Receive Two New Seagraves.

Phoenix, Ariz.—Two of the new Seagrave automobile combination fire trucks have arrived in this city. They were run up to the central fire station and will probably be placed in commission not later than Oct. 1. The new fire fighting machines are painted a dull gray, with gold trimmings. The third truck is expected to arrive in a few days and Chief Sullivan will then be in a position to formally open the two new stations, one at Five Points and the other on Van Buren street at the city pumping plant. The big trucks, besides carrying two chemical tanks and equipment consisting of extension ladders, axes, etc., carry each 1,500 feet of hose. They are geared at 25 miles an hour, although it is expected that considerably more speed than this may be attained upon paved streets if necessity requires. An attachment accompanies the trucks, whereby steamers may be attached and drawn to a downtown blaze.

#### The First Auto Fire Engine.

Winchester, Va.—Among the many reminiscences that spring up about the time of the convention is one this year of what is claimed to be the first piece of auto fire apparatus built in the country. It was made by the Howe Fire Engine Co., Indianapolis, Ind., for the Charlie Rouss Co. in this city and was shipped December 9, 1907. The machine, which is illustrated here, was a compound fire engine and hose wagon, consisting of a touring car body on a heavy steel armored chassis, and was equipped with a four-cylinder Rutenber 35 to 40 h.p. motor and a compound triplex pumping engine. The transmission allowed of two speeds forward and one back and was chain driven and had roller bearings. The brakes were expanding type hub brakes. The tires were solid rubber with detachable traction chains or drives. The ignition was jump spark, quad vibrator. The cooling system consisted of a tubular radiator with roller bearing fan. The speed was four to 30 miles an hour. The pump was located under the back of the chassis, geared so that the entire motor power could be transmitted to it. The capacity of the pump was 300 to 400 gallons per minute, against heads of 250 to 300 feet, or 1½-inch stream 175 to 200 feet and two 1-inch streams 150 to 175 feet. The hose body on rear of chassis had a capacity of 1,000 feet of hose. The fire fighting equipment included lanterns, torches, nozzles, and two 3-gallon and two 5-gallon extinguishers.



CLAIMED TO BE FIRST AUTO APPARATUS.

#### New Combination for Pomona.

Pomona, Cal.—Fire Chief Wilkinson is awaiting the arrival of the new combination hose wagon and pressure pump which has been shipped from the American-La France factory at Elmira, N. Y. The new rig is an automobile truck of 100 horsepower, designed to carry hose. The equipment costs \$9,000, which will come out of the \$15,000 bond issue for fire department improvement.

#### Regulate Speed of Fire Autos.

Salt Lake City, Utah.—The city commission has amended the traffic ordinance so as to permit automobiles of the fire and police department to travel at a speed not to exceed thirty miles an hour when answering calls. The amendment was made as a direct result of the \$500 verdict rendered in the district court last week against Fire Chief W. H. Bywater for the death of a little girl, who was killed by his machine in which he was responding to an alarm. One of the principal arguments of counsel for the plaintiff in the suit was that at the time of the accident the chief's machine was exceeding the speed limit, fifteen miles an hour. It is understood that the amendment passed is in the nature of an emergency clause which later may be amended when Mayor Park introduces a new traffic ordinance which he is now preparing.

#### Williamsport's New Combination.

Williamsport, Pa.—The location of the new American-La France engine just bought has not yet been decided on. The American-La France Co. has loaned a piece of apparatus and this will be returned now the new machine has arrived. It has not yet been decided whether the new fire-fighter is to go into service in Newbury or in the heart of the city.

## GOVERNMENT AND FINANCE

### To Draft New Charter.

Springfield, Mass.—The committee of 100 citizens, representing business and social organizations, who will try to draft a new charter for Springfield during the next three months, has commenced work. The "charter 100" will finish by January 1, so that a charter may be presented at the next session of the legislature. If it does not, a petition will be filed anyway, to guarantee the matter a place on the legislative calendar. The big committee idea was conceived last winter by the Board of Trade after one of Springfield's numerous efforts to get a new charter had fizzled. The document the 100 men will evolve is expected to get the support of the entire city. In the past the framing of a proposed charter has been useless because citizens invariably split into active factions against it.

### Maine Wants Utilities Board.

Portland, Me.—The Public Utilities Act, passed by the last legislature, was adopted by a referendum vote of nearly two to one at the state's election, according to a tabulation of unofficial returns. The act creates a commission to control all public utilities of the state.

### Taxes in Commission Cities.

Wildwood, N. J.—The tax rates of Cape May County show that the three cities with commission form of government have the lowest tax rates by a considerable amount. These rates are: Wildwood, \$2.25; Sea Isle City, \$2.24; Ocean City, \$2.25. The following do not have commission government: Cape May, \$2.39; Wildwood Crest, \$2.37; North Wildwood, \$2.37; Avalon, \$2.63; Stone Harbor, \$2.62.

### Turns Down Commission Form.

Mitchell, S. D.—Succeeding a brief campaign which was characterized by considerable ill feeling, advocates of the commission plan of government for Mitchell were decisively defeated in the special election. The vote was two to one against the proposed change in municipal government. Sentiment was aroused in opposition to the commission plan largely because of the belief on the part of the better class of citizens that the campaign was inaugurated through spite for the present administration, at the head of which is Mayor A. E. Hitchcock. The latter is the chief factor in pushing the suits, now pending in court, of the city of Mitchell against the Dakota Central Telephone Co., which is operating its exchange in this city despite the fact that its franchise has expired. Injunction proceedings, instituted by Mayor Hitchcock and City Attorney Lauritz Miller, have been held up by the telephone company. Inasmuch as the petition asking for a special election on the commission plan was drafted and set in motion by an assistant in the offices of the local attorneys for the telephone company, the feeling gained ground that the corporation was the real instigator of the movement. This feeling, more than anything else, it is said, was responsible for the defeat of commission advocates.

### Two Bond Issues Invalid.

Columbia, S. C.—The Supreme Court held invalid the \$500,000 bond issue voted by citizens of Columbia for water and sewerage extensions, and the \$60,000 bond issue voted by the citizens of Orangeburg for the building and operation of an electric light plant and water works system. The main question on which the issues were thrown out was that there should have been separate votes on the water and sewer extensions and on the light plant, and that the amount to be spent in each should have been stated. The court holds that bonds cannot be voted for building or extending water and sewers together, and that there must be a separate vote on the amount to be expended on the extensions of the water works system and on the sewerage system. The decision follows that previously rendered in the case of the Rock Hill bonds. The court also held in the Orangeburg case that there is nothing in the commission form of government act under which that city is governed, abrogating the provision that commission-

ers of public works are to be elected at the same time the bonds are voted and declared the Orangeburg issue invalid on this point also.

### Annexation to Plainfield.

Plainfield, N. J.—By a vote of 369 to 330 the Borough of North Plainfield decided at a special election in favor of being consolidated with the city of Plainfield.

## STREET CLEANING AND REFUSE DISPOSAL

### Street Cleaning Department Exhibit in New York.

New York, N. Y.—The Department of Street Cleaning of New York will hold an exhibition of street cleaning appliances during the week beginning Nov. 23, 1914, at one of the recreation piers near the East River. The purpose of this exhibition is threefold: to show the people of the city of New York the types of equipment now in service; to give manufacturers of modern street cleaning apparatus an opportunity of exhibiting their various appliances, not only to the citizens of New York, but also to officials of surrounding communities who will be invited to attend; to provide an opportunity for practical tests or demonstrations of street cleaning appliances under such conditions as will be acceptable to the city and manufacturers. The street cleaning apparatus proposed for exhibition will cover all sorts of brooms, brushes, sweeping machines, flushing machines and other equipment or appliances used in cleaning streets and removing snow; garbage, ash and rubbish cans or receptacles used by householders; carts, wagons, motor trucks or other vehicles used for collecting garbage, ashes, rubbish and street sweepings; conveyances for transporting refuse by water or by rail; methods used for the disposal of garbage, ashes, rubbish and street sweepings, including garbage reduction works, garbage crematories, incinerators, destructors, and other appliances. The city of New York is considering the adoption of improved methods and appliances for street cleaning, refuse storage, refuse collection and refuse disposal. An appropriation amounting to \$250,000 has been made for the purchase of apparatus to be installed in a "Model District" of the Borough of Manhattan.

### Council May Not Sell Garbage Cans.

Durand, Mich.—A protest by Durand merchants against the common council going into the retail business has been so strong that the council has rescinded a resolution authorizing the city clerk to buy garbage cans and retail them at actual cost. When the council passed an ordinance requiring the residents to provide themselves with garbage cans complying with certain specifications it authorized the city clerk to buy cans that would fill the requirements and to sell them at cost. Now the dealers will sell the cans to the residents.

### Garbage Incinerator to Save Money.

Iron Mountain, Mich.—The installation of a garbage incinerator which will save the city \$2,800 a year in the disposition of refuse is planned. The annual outlay for operating the plant proposed is \$3,300, as compared to \$5,500 expended now.

## RAPID TRANSIT

### New Boston Subway Line.

Boston, Mass.—The new Boylston street subway has been formally opened to the public. The opening has several times been postponed. The day prior to the opening an official inspection trip through the \$4,500,000 tunnel was made under the auspices of the Boston Transit Commission. Special cars were furnished and officials of the state, of the city of Boston and suburban towns and cities to be affected by the new route were conducted through the tube and given an opportunity to inspect it. The Massachusetts public service commission granted a certificate of operation before the official opening, after inspection. The commissioners thoroughly examined and tested the rails, tracks, switches, signals and other automatic apparatus.



### San Francisco's \$9,000,000 Street Railroads.

San Francisco, Cal.—To construct 28 municipal railway lines for which applications have been filed will cost \$9,000,000, the city engineer has reported to the supervisors. These proposed lines are in addition to those for which bonds have been voted. Their total length is approximately 89 miles, and the city engineer estimates the cost at about \$100,000 a mile. The length of a road across Golden Gate Park and thence to the ocean beach and Sloat Boulevard will be 8.8 miles. The proposed road to connect with the Geary street line at Masonic avenue and to run across Golden Gate Park and into the Sunset district will be 13.2 miles long. Other proposed routes are from Potrero avenue to the water front at Hunter's Point, 8.5 miles; on Market street, from Geary and through the Twin Peaks tunnel, 7.9 miles; from Geary street and 33d avenue to Cliff House.

### 25-Year Franchise Granted.

Portland, Ore.—The Portland & Oregon City Railway Company has been granted a 25-year franchise over various streets in this city which will be used for its proposed inter-urban service to Oregon City. Mayor Albee and Commissioners Dieck, Bigelow and Daly voted for the measure. It is provided in the franchise that work shall commence within 30 days after the ordinance finally goes into effect, which will be 30 days after its passage; that it shall be completed and in operation within 18 months, and that not less than \$150,000 shall be expended in its construction. A bond of \$5,000 is required. One provision is that six street car fares for transportation inside the city limits shall be sold for 25 cents. Another is that the franchise cannot be absorbed by any rival railway company and that no sale or transfer of the franchise can be made without the consent of the Council. The company is required to pay the city in compensation for the grant 5 cents a lineal foot for each foot of single track each year during the life of the grant. In addition the company will pay the city 3 cents for each car crossing the Hawthorne bridge.

## MISCELLANEOUS

### To Investigate Smoke Nuisance.

Salt Lake City, Utah.—If the city will make the necessary appropriation, the metallurgical bureau of the University of Utah will undertake a systematic study of the smoke problem in Salt Lake. A resolution recently adopted by the board of governors of the Commercial club was forwarded to the city commission asking that an appropriation to cover the cost of the investigation be made. The resolution was accompanied by a plan for a systematic investigation, evolved by Prof. D. A. Lyon, government expert in charge of the university bureau. In a letter to the city commission George W. Snow recommends that the officer of the United States bureau of mines at the University of Utah be allowed to conduct an investigation as to the smoke nuisance in Salt Lake, and that the city make an appropriation to cover the cost of the investigation.

### New Municipal Market Opened.

Raleigh, N. C.—Mayor Johnson and many other speakers formally opened Raleigh's fine new market building. Ground was broken for the market building last December and the work was completed Sept. 15. The cost of the building as it stands is \$24,582.81. The cost of the equipment was \$8,320.

### May Not Solicit Alms in Los Angeles.

Los Angeles, Cal.—The Salvation Army, recently forbidden to solicit alms here, lost its legal fight against the ruling of the Municipal Charities Commission. The ruling was the outcome of an inquiry based on an allegation that the army sent out of the city at least one-third of the revenues derived from the charitably inclined, in defiance of a local regulation which prescribes that all charity funds shall be used for the relief of the needy within the city of Los Angeles. The Salvation Army has no recourse now except an appeal to a higher court.

### City Will Plant Trees for Property Owners.

Brooklyn, N. Y.—Announcement has been made by Park Commissioner Raymond V. Ingersoll that the Brooklyn Park Department was now prepared to plant trees on city streets. Any abutting property owner who desires a tree or trees set out in front of his property may procure the same at cost by applying to the office of the department. The Park Department furnishes the tree, with all necessary accessories, such as soil, stake, tree-guard, etc. It performs all necessary labor, such as cutting concrete or flagged sidewalks, digging holes, planting trees, staking and applying water to the roots just after planting; cleaning away debris, rubbish, etc., and leaving the street in a clean and orderly condition. It attends to securing of all permits for opening of sidewalk, etc. The cost of planting is borne by the property owner. The sum of \$8 will be deposited in the office of the Department of Parks when application is made. The Park Department will be merely the agent in this plan of co-operative tree planting. A receipt will be issued to the depositor, also a guarantee to replace the tree should it die of natural causes within a period of three years. The Park Department reserves the right to decide on the species of tree to be planted, also the location and distance between trees. This is necessary in order that a uniform system of planting may be promoted on the streets and avenues in the Borough of Brooklyn. It will be the duty of the property owners to apply a quantity of water to the tree after planting. At least six gallons are required, and the application should be once a week during dry weather. After the tree is planted, the Park Department will care for it, just as is now the case with all street trees in the Borough. Many house owners have already accepted the offer.

### City May Go into Coal Business.

Wilmington, Del.—The city council will name a committee to investigate the advisability of the city establishing a municipal coal yard for the sale of fuel to the poor at cost in order to alleviate winter suffering. The coal-yard would be operated by the Council on a strictly non-partisan basis. Council already has a small trust fund, the revenue from which is applied to providing very poor persons with coal, and it appropriates an additional amount. The appropriation last year was \$1,500, and while it was understood each Councilman was to distribute only 20 tons, some exceeded that apportionment and the total amount of money spent on coal was about \$2,700, some of which, about \$500, will have to come out of this year's funds, the bill having just been received. The appropriation for this year is \$1,500.

### Mobile Plans Municipal Docks.

Mobile, Ala.—Mobile is planning a municipal docks system to meet the demands of a commerce that, just prior to the outbreak of the European war, had grown beyond the facilities of the port to handle. The first step in her campaign will be to ask the legislature of 1915 to cede to her all of those "made" lands thrown up in Mobile bay by the deepening and straightening of a 27-foot channel. At the close of the fiscal year on June 30 Collector of Port Percy W. Maer announced to Alabama that the state's seaport had handled in 12 months \$50,000,000 worth of business, exclusive of business that was coastwise. That was a clear gain of \$20,000,000 over the preceding year. Mayor Pat J. Lyons outlines the city's plan. It is to acquire at a cost of nothing these "made" lands. At once, he said, the city could spare \$500,000 as a nucleus for the vast sum that will eventually be invested. Upon the new ground will be erected docks and warehouses capable of handling more business than is handled at any southern port. Mayor Lyons is now in communication with the best informed builders of docks in the world. He is casting about for a competent consulting engineer before whom he will lay the city's plans for expansion. The city at present owns 1,500 feet of improved harbor front land. Upon it is constructed what engineers have said are ideal sheds, made of steel. The floors are of concrete, rendering the warehouse ratproof. The sides are open, rendering the building itself practically fireproof.



**York City Planning Commission.**

York, Pa.—At a special meeting of city council, a city planning board, composed of five men, was appointed under the provisions of that act of 1913, supplementary to the Clark act, which provides for the commission form of government in cities of the third class. The action was taken at this time because the city proposes to acquire several tracts for use as public parks. The new commission, which will act in conjunction with the city council, was appointed as follows: A. B. Farquhar, term five years; William P. Swartz, term four years; J. Horace Rudy, term three years; John B. Hamme, term two years, and J. Calvin Strayer, term one year.

In the act under which the city planning commission was appointed there is a provision that the members of the committee shall receive copies of all the city ordinances and amendments thereto, relating to the location of any public building and the extension, widening, narrowing, enlargement or other work on highways, location of bridges, tunnels, subways or railways. The power is given the commission to disapprove of any such ordinances, such disapproval to be communicated to councils in writing, but it shall not operate as a veto. City maps come under the jurisdiction of the commission which is to have jurisdiction also over the plans for property to be dedicated to the city for public use, such as parks and playgrounds. The act makes it unlawful for the city to record any such properties acquired without the endorsement thereon of the commissioners. The disapproval of the commission of any such plan shall be deemed a refusal of the proposed dedication. The commission must also approve all sewer, water, gas or other main laid within the city before such work is done. Section 6 makes it impossible for any person holding a city office at present to become a member of the commission, except the mayor, members of councils or commissioners.

**Tree Planting in Newark, N. J.**

Newark, N. J.—About 3,000 new trees will be planted in various parts of the city this fall and next spring under the supervision of the Shade Tree Commission. The work will begin about November 1. This is in addition to the work of replacing trees that have been disturbed. The commission is preparing its lists to place trees in about sixty different streets. Under the law the commission has the power to plant the trees wherever it thinks they are needed. An assessment of \$3.50 is levied on the property holder in front of whose premises the tree is planted.

**Advertising Edition of Annual Report.**

Waukegan, Ill.—The city officials have a rather novel plan for advertising the city's industrial development and the splendid opportunities of Waukegan. The mayor and commissioners are planning to make a "booster" edition out of the annual report to be submitted at a date in the near future. The plan of the city officials is to include thorough articles and illustrations dealing on the various industries of the city in full in the various municipal departments' annual report.

**\$2,000,000 Spent in Reclamation.**

Newark, N. J.—The Board of Works has received a report from the engineering department showing that approximately \$2,000,000 will have been expended on the meadow reclamation project when existing contracts are finished. The report shows that \$336,324.79 has been expended in the purchase of about 930 acres of land within the development zone, which has a frontage of 4,000 feet on Newark Bay and a depth of 13,000 feet. The city has obligated itself, according to the report, to the extent of \$1,473,258.99 of expenditures prior to September 1 this year. The prediction is then made that before December 31, 1915, Newark will have completed a meadow development, the aggregate cost of which will have been \$2,000,000. This will include a ship channel 7,000 feet long and 400 feet wide at the bottom, with a depth of 20 feet at low water; a dock frontage of 4,500 feet, a pier 1,200 feet long and 150 feet wide, extending into the bay; a reclaimed area of 300 acres; a railroad distributing system; at least one wide avenue of approach and a construction plant available to reclaim the additional 870 acres of meadow land.

**LEGAL NEWS****A Summary and Notes of Recent Decisions—  
Rulings of Interest to Municipalities****Streets—Injury to Pedestrians.**

*Williams v. Mayor and Council of Washington.*—In the absence of any statutory requirement, a municipal corporation is not under any obligation to light its streets with lamps, and from the exercise of its discretion in regard to whether it will do so or not no liability will arise. But if a municipality obstructs a street or allows it to remain obstructed, or out of repair, or in a dangerous condition, the fact of the absence of lights or safeguards of any character at the place or that a street light established at that point has been allowed to remain unlit for a number of nights before an injury occurs to a pedestrian may be considered, along with the other evidence, in determining whether there is negligence in failing to keep the street in a reasonably safe condition for passage. There was no evidence authorizing the submission to the jury of the question of whether the injury to the plaintiff was caused by a fall "from the property" of an owner of adjacent land, rather than by a fall from the sidewalk into the street, which had been lowered eight or ten feet below the sidewalk at that point.—Supreme Court of Georgia, 82 S. E. R. C. 56.

**Occupation Taxes—Uniformity—Classification.**

*Salt Lake City v. Utah Light & Ry. Co.*—An ordinance of the city of Salt Lake provides that corporations engaged in generating and selling electricity and "using meters" shall obtain a license therefor and pay a license tax amounting to \$1 a year for each and every meter used. Held, that the use of meters was not a valid basis of classification, and that the ordinance was invalid for lack of uniformity in relieving from liability such concerns as furnished and sold electricity not measured by meters, and this regardless of whether it was shown that such concerns were not otherwise subjected to a similar tax.—Supreme Court of Utah, 142 P. R. 1067.

**Electric Light Plant—Operation by City.**

*Hurze v. City of Iola et al.*—A city which operates an electric light plant and furnishes electricity to its patrons for lights acts in its proprietary capacity, and is held to the highest care to avoid injury to such patrons. Notice to a commissioner of such city between 2 and 3 o'clock that there was something wrong with the electricity in the vicinity of a building 100 feet from the plaintiff's meat shop, the current in both buildings being controlled by the same transformer, required prompt attention, and justified the jury in finding the city negligent in not preventing an injury to plaintiff in his shop two or three hours later, caused by a defect in such transformer.—Supreme Court of Kansas, 142 P. R. 947.

**Limitation of Debt—Taxes—Collections.**

*Seymour v. City of Ellenburg.*—Taxes, both real and personal, which have been delinquent for 6 years, will be presumed to have been paid, and hence taxes, delinquent for 20 years or more, cannot be treated as cash assets by a municipality in determining whether its indebtedness has exceeded the constitutional limits.—Supreme Court of Washington, 142 P. R. 876.

**Public Improvements—Acceptance—Review.**

*Mueller et al. v. City of Vancouver et al.*—A city council having discretion in the matter of accepting work for a public improvement, and the right to decide, their acceptance cannot be reviewed by the courts, unless something different from what was contracted for is accepted, or the defects in the work are so open and notorious that the city must be presumed to have taken notice of the nonfulfillment of the contract.—Supreme Court of Washington, 142 P. R. 868.

## NEWS OF THE SOCIETIES

### Calendar of Meetings.

Oct. 7, 8, 9.  
LEAGUE OF KANSAS MUNICIPALITIES.—Lawrence, Kan. Secretary, C. H. Talbot.

Oct. 1-9.  
MOTOR TRUCK CLUB OF AMERICA.—Annual Convention, Detroit, Mich. President, George H. Duck, New York.

Oct. 7-17.  
ELECTRICAL EXPOSITION AND MOTOR SHOW.—Grand Central Palace, New York City. George F. Parker, Vice-President and General Manager, 124 West 42d street, New York City.

Oct. 8-10.  
GULF AND INTEROCEAN NATIONAL HIGHWAY ASSOCIATION.—Conference, New Orleans, La. Secretary, John B. Kent, Lake Charles, La.

Oct. 12-16.  
AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Convention, Atlantic City, N. J. E. B. Burritt, 29 West 39th street, New York City.

Oct. 12-16.  
LEAGUE OF CALIFORNIA MUNICIPALITIES.—Seventeenth Annual Convention. Hotel Del Monte Monterey, Cal.

Oct. 14, 15.  
ILLINOIS MUNICIPAL LEAGUE.—Annual Convention, Urbana-Champaign.

Oct. 20-23.  
INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.—Annual Convention, Grunewald Hotel, New Orleans, La. Secretary, Mr. McFall, Roanoke, Va.

Oct. 21-23.  
ALABAMA GOOD ROADS ASSOCIATION.—Nineteenth Annual Convention, Montgomery, Ala. Secretary, J. A. Rountree, 1021 Brown Marx Bldg., Birmingham, Ala.

OCT. 21-23.  
PENNSYLVANIA WATER WORKS ASSOCIATION.—Annual Convention, Haddon Hall, Atlantic City, N. J.

Oct. 28-31.  
NORTHWESTERN ROAD CONGRESS.—Annual Convention, Milwaukee, Wis. Secretary, J. P. Keenan, Milwaukee.

Nov. 9-13.  
FOURTH AMERICAN ROAD CONGRESS.—American Highway Assoc. and American Automobile Assoc., Atlanta, Ga. Secretary, J. S. Pennybacker, Colorado Building, Washington, D. C.

NOV. 12-14.  
NATIONAL CONVENTION OF MAYORS OF AMERICAN CITIES.—Philadelphia, Pa.

Nov. 17-21.  
NATIONAL MUNICIPAL LEAGUE.—Annual Convention, Baltimore, Md. Secretary, Clinton Rogers Woodruff, North American Building, Philadelphia, Pa.

Nov. 18-20.  
WASHINGTON STATE GOOD ROADS ASSOCIATION.—Spokane, Wash. Secretary, M. D. Lechey, Alaska Building, Seattle, Wash.

NOV. 23-28.  
EXHIBITION OF STREET CLEANING APPLIANCES.—Department of Street Cleaning, City of New York. J. T. Fetherston, Commissioner of Street Cleaning.

Nov. 30-Dec. 6.  
AMERICAN PUBLIC HEALTH ASSOCIATION.—Forty-second Annual Convention, Jacksonville, Fla. Dr. C. E. Terry, Chm., Executive Committee.

Dec. 2, 3, 4.  
CITY MANAGERS' CONVENTION.—Springfield, Ohio. C. E. Ashburner, City Mgr., Springfield.

Dec. 14-17.  
AMERICAN ROAD BUILDERS' ASSOCIATION.—11th Annual Convention; 5th Annual Good Roads Congress, and 6th Annual Exhibition of Machinery and Materials, International Amphitheatre, Chicago, Ill. Secretary, E. L. Powers, 150 Nassau st., New York, N. Y.

Feb. 10-17, 1915.  
EIGHTH CHICAGO CEMENT SHOW.—Coliseum, Chicago, Ill. Cement Products Exhibition Co., J. P. Beck, General Manager, 208 S. La Salle Street, Chicago, Ill.

### INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.

#### Conditions for Pumping Tests.

The conditions to be observed in the tests of automobile pumping engines at the convention have been given out officially. Exhibitors will be required to state in advance the rating they place on their pumping engines, that is, gallons discharged at 120 pounds net pressure, at 200 pounds net pressure, and

at 250 pounds net pressure, and to furnish other information called for in a form, which is substantially as used for the printed results of the 1913 tests. Provision will be made for exhibitors to run a preliminary test, preferably during the week preceding the convention, to verify the ratings. The preliminary test is expected to be sufficiently exhaustive to determine how much water each engine can deliver at the various pressures above specified, but it is to be definitely understood that this delivery shall be no more than can be maintained for the full period of the final test. An engine able to deliver, for example, 740 gallons at 120 pounds net pressure will be given a corresponding layout of hose and nozzles. Ratings of engines will be considered as the next lower even 50 gallons than the quantity delivered at the preliminary test. For example, an engine delivering 740 gallons at 120 pounds net pressure will be rated at 700 gallons, and an engine delivering 880 gallons will be rated at 850 gallons. Any engine rated at less than 700 gallons will be permitted to use a suction not more than 4½ inches inside diameter; any engine rated at 700 to 850 gallons will be permitted to use a 5-inch suction; any engine rated at 900 gallons or more will be permitted to use a 6-inch suction. The committee reserves the right, after the completion of the tests, to place any engine in another class than the one in which it is entered.

The test will continue for a duration of six hours, but provision will be made for any exhibitor who so elects to continue for an additional period, delivering rated capacity at 120 pounds net pressure. The six-hour run will be divided as follows: Three hours delivering at 120 pounds net pressure the quantity determined by the preliminary test; one and one-half hours delivering at 200 pounds net pressure the quantity determined by the preliminary test; one and one-half hours delivering at 250 pounds net pressure the quantity determined by the preliminary test. If any engine is unable to maintain the net pressures noted above, the maximum obtainable pressure will be substituted.

During any of the runs not more than two men at one time will be allowed to operate or care for the engine. Exhibitors will be required to furnish in advance a chart showing the measured brake horsepower developed by their engines at rates of speed within the range likely to be reached during the tests. Provisions must be made by the exhibitor on each machine for an exposed shaft end, either on the motor or the pump, so that a hand revolution counter may be used to determine speed. The exhibitor must give exact dimensions of engine cylinders and length of stroke; from these the piston displacement in cubic inches per min-

ute will be figured, and comparisons will be made between the piston displacement, the brake horsepower of the engine and the power developed by the pump. Provision must be made for attaching the test gage to a connection at some convenient point on the discharge piping; test gages have ¼ inch pipe thread. The wharf on which engines will be tested is about 4 feet above water level. Gasoline of the same grade will be supplied for the use of all engines. Exhibitors may use any grade of lubricating oil desired. Records will be kept of the amount of each that is used.

### Proposed Changes in Constitution and By-Laws.

A special bulletin has been issued announcing the proposed changes to the constitution and by-laws of the association. These were read at the New York meeting, and were laid on the table until the New Orleans meeting, when they will be made special order for Tuesday, October 20, at 3 p. m. Article II of the constitution has proposed changes in two sections. The present sections read:

Sec. 2.—There shall be a board of directors, consisting of the president, secretary and three other members, to be appointed by the president, who shall serve for one year. This board shall meet at the time and place designated by the president. Only the actual expenses of the board shall be paid by this association for each member.

Sec. 3.—The three directors appointed by the president shall be known as the auditing committee, who shall select from their number one member to act as chairman. It shall be their duty to audit all accounts of the association, and receive bids for printing and all other supplies needed. It is proposed that hereafter there shall be a board of directors, consisting of the president, secretary, first and second vice-presidents and the chairman of the exhibit committee, who shall serve for one year. This board shall meet at the time and place designated by the president. Only the actual expenses of the board shall be paid by this association. It is also proposed in a new section 3 that the first and second vice-presidents and the chairman of the exhibit committee shall be known as the auditing committee, who shall select from their number one member to act as chairman. It shall be their duty to audit all accounts of the association, and authorize all expenditures. An entirely new section, section 3, has been added to Article IV. This reads:

Chiefs inviting the association to hold its annual meetings in their cities shall understand that the association expects and requires that their cities shall furnish without cost a hall suitable for holding the sessions of the association, an exhibit hall of ample size to accommodate the apparatus, equipment, etc., that may be reasonably expected to be offered for exhibition, and suitable grounds for the testing of steamers, trucks and other apparatus and appli-



ances. The necessary fire engines, hose, nozzles and a sufficient number of men to carry out the test as may be required by the exhibit committee. The exhibit hall and the testing grounds shall at all times be under the sole control of the exhibit committee, and under such rules as they may adopt. Badges for members, visitors and ladies shall be furnished free to the association in such number as the directors may deem sufficient to accommodate the expected attendance. The material, design and workmanship of badges to be entirely in the hands of the local chief. Entertainments, such as the local chief may wish to arrange for, must not interfere with the business program of the association.

It is proposed to make important changes in the classification of the membership and the dues, as stated in Article V. As this reads now: The membership shall consist of: (a) active, (b) associate, (c) honorary, (d) life. These classes are defined as:

(a) Active Members—Chiefs of fire departments, chiefs or superintendents of insurance patrols, chiefs of private fire departments, shall be eligible to active membership. Annual dues, \$5.

(b) Associate Members—Individuals representing manufacturers and dealers in fire department supplies, individuals representing firms and corporations interested in the protection of life and property against fire, shall be eligible to associate membership. Annual dues, \$5.

(c) Honorary—Honorary life membership may be conferred upon active members upon their retirement from office, provided they have been members of the association for a period of five years immediately preceding the date of their retirement, and provided further that they are not identified with fire protection from a commercial standpoint. Honorary life membership carries all the privileges of active membership, without dues, except the right to vote.

(d) Life—Individuals, firms and corporations interested in the protection of life and property against loss by fire shall be eligible to life membership upon payment of the sum of \$25.

It is to be decided now whether changes should be made changing class C to "Honorary Life" and adding a new Class E, to be known as "Contributing." The new definitions as proposed are:

(a) Active Members—Chiefs of fire departments, chiefs or superintendents of insurance patrols, chiefs of private fire departments, shall be eligible to active membership. Annual dues, \$10.

(b) Associate Members—Fire commissioner, city officials, assistant chiefs and members of fire departments, individuals representing firms and corporations interested in the protection of life and property against fire shall be eligible to associate membership. Annual dues, \$10.

(c) Honorary Life Members—Honorary life membership may be conferred upon active members upon their retirement from office, provided they have been members of the association

for a period of five years immediately preceding the date of their retirement, and provided further that they are not identified with fire protection from a commercial standpoint. Honorary life membership carries all the privileges of active membership without dues.

(d) Life Membership—Individuals, firms and corporations interested in the protection of life and property against loss by fire shall be eligible to life membership upon the payment of the sum of \$100.

(e) Contributing Members (A New Section)—Individuals and firms, manufacturing and dealing in fire apparatus, fire department supplies and fire prevention appliances and materials, exhibiting at the annual meetings, shall pay an annual membership fee, of such sum as the directors may determine from year to year, based upon the number of square feet required and used by them for their exhibit, provided that the membership fee for any one year shall not be less than ten cents per square foot of space used.

By a suggested change in the by-laws, section 1, the annual membership fee may be raised from \$5 to \$10. Section 5, which now reads: "The president shall appoint all committees, and all standing committees shall be appointed at the first business session of each annual meeting." It is proposed to amend to: "The president shall appoint all committees authorized by the constitution and by-laws, and such other committees as may be necessary to conduct the business of the association. The president shall, within thirty days after his election, appoint the chairman of the exhibit committee."

A new section, 14, may be added to the by-laws, which reads: "The secretary shall not register or give a badge, or extend any courtesies of the convention, to any one, other than ladies accompanying members, representatives of the press and honorary life members, except upon the payment of the annual membership fee."

#### Massachusetts State Firemen's Association.

On Sept. 23d, the three-day convention of the association opened in Athol, with a large attendance of firemen from all over the state.

Chief E. F. Dahill, of New Bedford, called the convention to order. Addresses of welcome by G. W. Boutelle and Chief Hall were followed by appropriate responses and a short address by President Dahill. An interesting paper on "Fire Prevention" was read by L. N. Boudoin of Fairhaven.

Other addresses delivered during the various sessions were: "The Problem of Handling and Storage of Gasoline in Connection with Motor Vehicles," by W. L. Wedger, of the state police in Boston; "Description of Method of Thawing Out Hydrants When Gasoline Motor Fire Engines Are Used," by G. V. Poole, of Boston; "Best and Most Useful Methods of Providing Adequate Exercise for the Permanent

Firemen," by Capt. W. Brophy, of Boston; "The Duty Call and the Spirit With Which the Firemen Answer It," by A. B. Jones, of Salem; "The Two Platoon System," by J. F. Hardy, of Boston; "Motor Fire Apparatus; Thoughts and Suggestions Regarding Same," by C. E. Stewart, of Boston; "Impressions Received During the Great Fire at Salem," by General C. H. Cole, of Boston.

Frank P. Hall, Chief of the Central Department, was elected president, and the following officers were chosen: D. Arthur Burt, Taunton, secretary; H. R. Williamson, Worcester, treasurer; Joseph A. Sanders, Somerville, first vice-president; H. J. McNeeley, Boston, second vice-president; J. S. Drinkwater of Cambridge, Thomas W. Hurley of Northampton, E. J. Barry of Brockton, Daniel Hogan of Holyoke, W. C. Lord of Peabody, Borine Kidzie of Malden, and L. E. Walsh of Springfield, honorary vice-presidents: Theodore Gallipeau of Boston and Frank Crocker of Nahant, directors for three years; Albert M. Laskey of Boston, member of committee on \$15,000 relief fund; F. O. Whitmarsh of Braintree, sergeant-at-arms.

#### AMERICAN ROAD CONGRESS.

Elaborate preparations are being made by the railroads to accommodate the good roads workers who will gather at Atlanta, Georgia, for the Fourth American Road Congress during the week of November 9. A special train will be operated by the Pennsylvania Railroad and the Southern Railway, leaving New York on Saturday, November 7, and arriving at Atlanta on November 8. Special cars will be put on for Philadelphia, Baltimore, Washington, Richmond and Norfolk. Delegates from the west and middle west will have the advantage of a special train leaving Chicago on the evening of November 7 and passing through Indianapolis, Cincinnati and Chattanooga en route to Atlanta. Arrangements are now being made for special service from Texas and southwestern points. Exceptionally low rates have been granted, particularly in the territory south of the Potomac and east of the Mississippi, where the rate per mile will average 1½ cents. Greatly reduced rates have also been granted in western territory, as well as on the eastern trunk lines.

On account of the great improvement made within the past few years on the public highway south of Washington, considerable interest is manifested in touring facilities. Among the parties arranging to make the trip by automobile are members of the State Board of Public Roads of Rhode Island, who expect to attend the Congress in a body. Not least among the important factors which have made for better road conditions between Washington and Atlanta is the co-operative object lesson in maintenance

(Continued on page 537.)



## MOTOR FIRE APPARATUS

New Improvements Developed and Recent Installations Announced Since the Last Convention of the International Association

### AMERICAN-LA FRANCE. Front Drive Aerial Truck and Steam Fire Engine.

Since the last convention the American-La France Fire Engine Co., Elmira, N. Y., have brought out two new pieces of apparatus—both front-drive—an aerial truck and steam fire engine. The type 18, gasoline two-wheel front-drive aerial has a speed of 25 miles an hour. The truck has a gasoline capacity of 15 gallons. The wheels are of the artillery type and the tires solid, dual front and single rear. There are four sizes of truck—55, 65, 75 and 85-foot and the wheel-bases of these are respectively 254, 296, 334 and 392 inches. The lighting system consists of two 10-inch electric reflector lamps and one 10-inch electric searchlight and the truck is equipped with a locomotive bell and a hand-operated siren horn. The fire-fighting equipment consists of two 3-gallon Babcock standard extinguishers and tools including lanterns, axes, picks, poles, crowbars, shovels, cutters, door-opener, battering ram, buckets and box. The ladder equipment varies with the size of the truck, all sizes having 12-foot roof ladder and 16, 20 and 24-foot single ladders. The three largest trucks carry also 28-foot single ladders and the two larger 32-foot single ladders. The extension ladders are respectively 50, 45, 40 and 35-foot.

The gasoline two-wheel front-drive steam fire engine is also of type 18 construction, one of these, built for the Atlantic City, N. J., fire department, being shown in the illustration.

Both machines of standard American-La France construction, the motor being cast with cylinders in pairs of specially selected grey iron and it is water cooled. The crank shaft is machined from solid heat-treated nickel steel. The clutch is of the multiple disc dry plate type. The control is by a hand-lever at steering wheel and by foot accelerator pedal. The ignition is high-tension jump spark, Bosch magneto. The steering gear is of the non-reversible worm and gear type. The transmission is by sliding gear, selective type, three speeds forward and one reverse. The side and cross-mem-

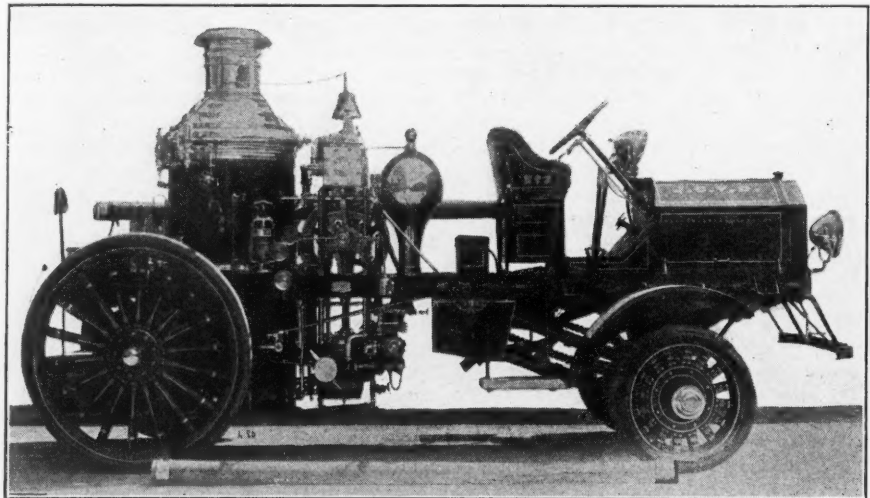
bers of the frame are built of chrome nickel steel.

The front drive axle assembly is illustrated showing the axle complete with the face of housing on right side removed and also showing the bevel gear drive.

### WHITE. Underslung Chassis for Motorizing Steam Fire Engine, Chemical and Hose Truck and Hook and Ladder.

During the past year the White Co., Cleveland, O., has been very active in its deliveries of fire apparatus. Among

are using White runabouts; there are four three-ton hose wagons in the department and a White ambulance and supply wagon are also used. The newly motorized engine is mounted on an underslung frame 5-ton chassis. The engine of this is 40 h. p., and consists of four cylinders cast in block. The steering is left-side drive, with right-hand control through special White worm and sector. The transmission is sliding selective, with four forward speeds and one reverse. The service brakes are operated by pedal and the emergency brakes by hand lever. The drive is shaft and chain final. The



AMERICAN-LA FRANCE FRONT-DRIVE STEAM FIRE ENGINE (ATLANTIC CITY, N. J.)

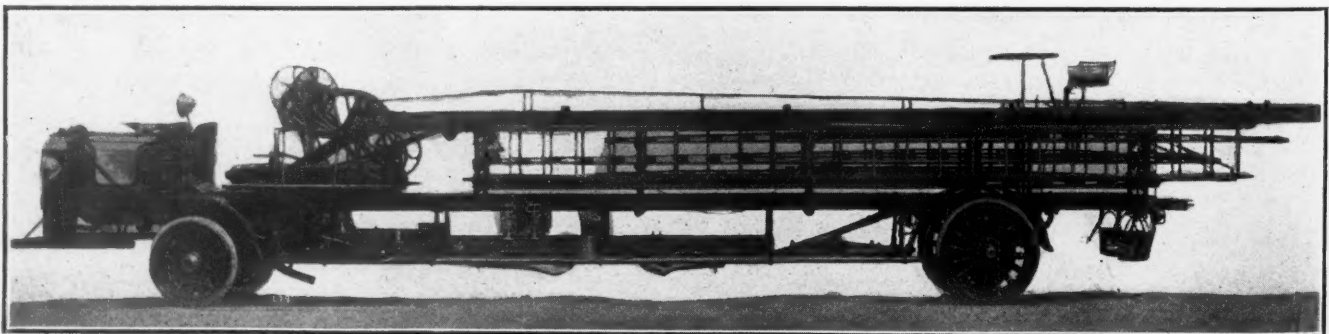
the latest type developed is the underslung chassis for converting a horse-drawn steam pumping engine into a motor apparatus, such as was made for the Baltimore, Md., Fire Department. The hook and ladder truck for Sioux City, Ia., and the combination chemical and hose wagon for Bakersfield, Cal., represent the other larger classes of motor-driven apparatus which this company produced this year.

The motorizing of a La France steam pumping engine by the Baltimore department helped to make up the 19 White machines now owned by that city, of which 12 are in the service of the fire department. Five district chiefs

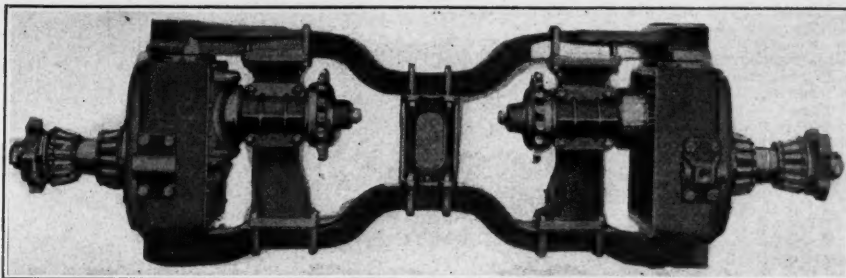
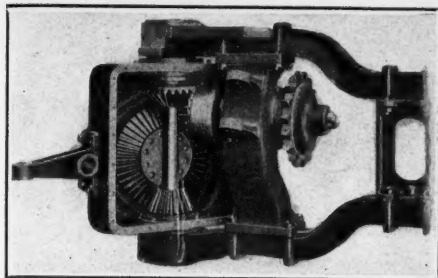
frame is standard 7-inch I-beam underslung.

The Sioux City hook and ladder has an interesting history, having been the means of rescuing five people entrapped on the upper floors of a burning building. The walls had collapsed, burying a horse-drawn aerial and killing several firemen. The new hook and ladder was immediately put to work pulling down the weakened walls, as is shown in the illustration. The truck consists of a special hook and ladder body on a special 3-ton chassis. The motor is six-cylinder and the truck has a wheel-base of 242 inches.

The Bakersfield chemical and hose



AMERICAN-LA FRANCE FRONT-DRIVE AERIAL TRUCK.



BEVEL-GEAR DRIVE AND AXLE ASSEMBLY OF AMERICAN-LA FRANCE FRONT DRIVE.

wagon has a six-cylinder, 60 h. p. engine and is equipped with the White electrical system of starting and lighting. In this system both lighting and starting are performed by one motor-generator, which is controlled by a single knife switch. On closing the switch no further attention is needed on the part of the operator and the system will absolutely prevent stalling. The

**PEERLESS.****Four-Wheel Tractor for Hook and Ladder and Water Tower Trucks.**

The Peerless Motor Car Co., Cleveland, O., has recently developed a four-wheel tractor designed for hauling hook and ladder and water tower trucks. The handling of this type of apparatus, because of its necessarily

to haul fifteen tons behind, in addition to carrying four or five tons. The wheel base of the truck is 123½ inches and the turning radius is 20 feet. Otherwise the chassis, chassis equipment and finish are identical with those of the Peerless standard fire truck chassis. Some of the principal specifications of this chassis are:

**Motor:** Four-cylinder, four-cycle water-cooled type with cylinders of the best gray iron and of "T" head design cast in pairs. The motor develops 50 horsepower at 1,200 revolutions per minute.

**Gasoline Tank:** Seamless steel type with 25 gallons capacity.

**Cooling System:** The radiator is of the cellular honey-comb type made of heavy gauge metal. The water is circulated by a positive driven pump. The fan is driven from an extension of the crankshaft by means of a "V" belt. The unusually large capacity of the cooling system—8 gallons—with the large area of cooling surface provides exceptional efficiency under the most severe conditions.

**Lubrication:** Constant level splash type.

**Ignition:** Bosch dual type battery and magneto ignition with mechanical spark.

**Control:** Throttle and spark levers are located on top of the steering column in a fixed quadrant. An independent accelerator pedal is provided allowing the operator to control the motor by foot for quick acceleration in maneuvering.

**Steering:** Irreversible worm and gear type with unusually large wearing surfaces. The irreversibility of the worm prevents road obstructions communicating a jar to the steering wheel.

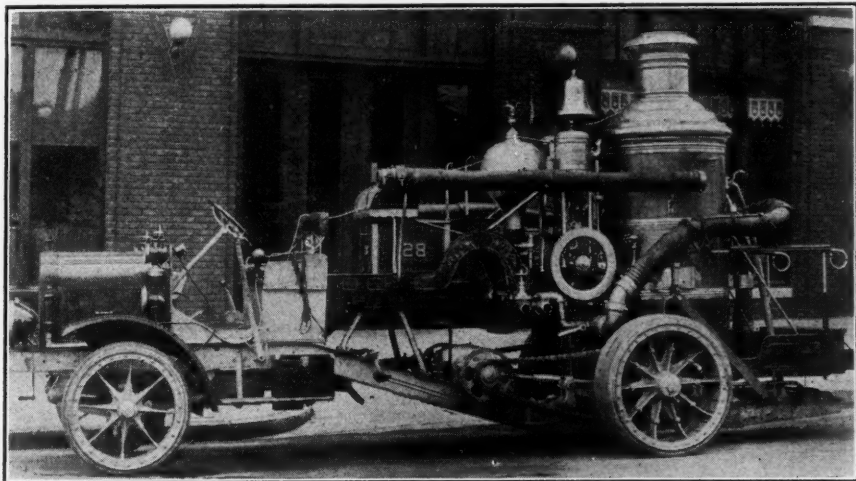
**Clutch:** Self-contained cone type engaging with the inner face of the fly-wheel rim.

**Transmission:** Sliding gear selective type. Peerless design, with four speeds forward and one reverse. Direct drive is on high speed.

**Speed:** The maximum speed is from 30 to 35 miles per hour.

**Brakes:** Two independent sets of brakes are provided. Service brakes are drums mounted on each jack shaft near speed case. They are of the contracting band type and are controlled through rods and equalizing levers by pedal. Emergency brakes are of the expanding shoe type. They operate on drums attached to the rear wheels and are controlled by a hand lever.

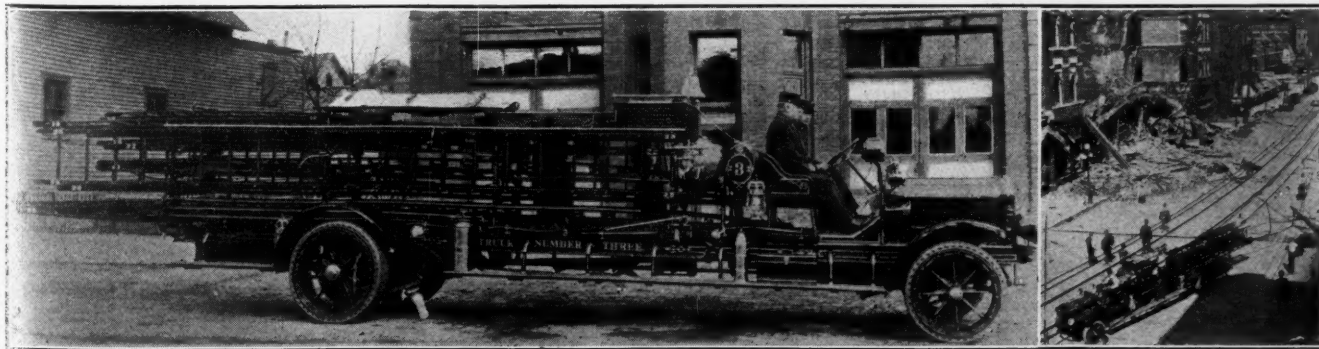
**Wheels:** Front 36 inches, rear 40. Taper roller bearings are provided for all wheels. These large wheels reduce vibration, insure easy riding and economy in wear on the truck and tires.



STEAM ENGINE MOUNTED ON WHITE UNDERSLUNG CHASSIS (BALTIMORE, MD.)

closed switch puts the motor in operation and starts the engine. As soon as a speed of a few hundred revolutions is reached, the generator, being slow-speed, the voltage of the motor-generator exceeds that of the battery and the battery is charged at all speeds above this point, at a definite governed rate. The motor changes to a generator above a certain speed and back to a motor below, automatically. The equipment of the Bakersfield truck consists of two 45-gallon chemical tanks, two hose reels, extension and scaling ladders, hand tanks, axes, lanterns and other necessary fire-fighting kit, as shown in the illustration.

awkward length, is quite a problem in design. The principal necessity of a tractor for this service is a short turning radius. The Peerless tractor claims the advantage of this feature and, attached to a 75-foot ladder truck, it can be completely turned about in a 28-foot street, as is shown in the illustrations on the next page. Having four wheels, the truck has a perfectly solid support for the front end and the machine retains its stability while the ladders are being operated. Since the greater part of the load is carried on the rear wheels, the weight on the front wheels is much reduced, making steering easier. The tractor is built



WHITE HOOK AND LADDER (SIOUX CITY, IA.)

AT WORK.



**Tires:** Front wheels are provided with single cushion compound rubber tires, 36 by 40 inches, and rear wheels with solid rubber block tires, 40 by 4 inches.

**Wheel Base:** 145 inches.

**Turning Radius:** 25 feet.

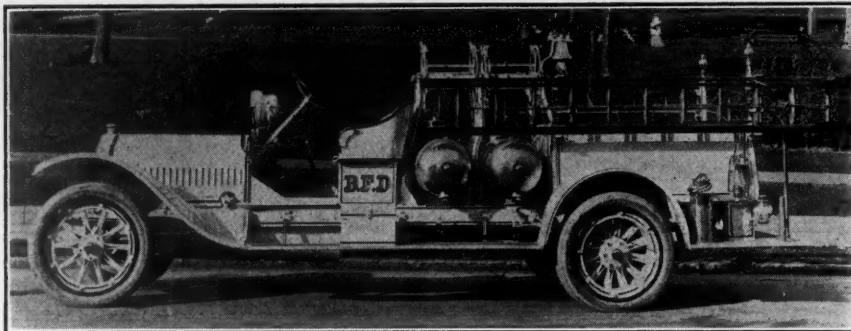
**Tread:** Front, 68 inches; rear, 69½ inches; width between rear wheels, 60½ inches.

**Frame:** Of standard 6-inch rolled channel steel, hot riveted, and thoroughly braced and trussed. Frame width, 38 inches outside; height from the ground, 33 inches loaded.

**Distribution of Load:** In excess of 80 per cent. of the paying load is carried on the rear wheels. This insures ample traction under all conditions, and by making possible the use of light flexible springs in front, preserves the important motor mechanism. It also makes steering easy. A low center of gravity overcomes any tendency to tip, and is accomplished without any sacrifice of road clearance.

**Starting and Lighting System:** Gray & Davis compound wound machine, constant speed, is belt driven from the transmission counter shaft. As the speed is constant the voltage also is constant, and the lights remain steady.

**Chassis Equipment:** Ten-inch Gray & Davis revolving searchlight mounted on the dash; two 10-inch Gray & Davis headlights, mounted on each side of the radiator; electric tail light; portable lamp with 40-foot cord; combination odometer and speedometer mounted on the dash; complete set of tools; tool box; battery box; electric horn; two combination oil and electric side lights mounted on the dash.



WHITE COMBINATION (BAKERSFIELD, CAL.)

chrome vanadium steel. The tires are of the fire truck type, 36 by 5 inches in front and 36 by 6 inches rear. The gasoline tank is located under the driver's seat and has a capacity of 24 gallons, four being for emergency. The machine is equipped with a Remy electric starter and is electrically illuminated throughout. The starter is so wired that it may be operated either by pushing a button on the wall or by the alarm. There is a Stewart-Warner speedometer located on the dash. The

twelve and twenty foot ladders, six Dietz King tubular lanterns, whistle and hand gong.

Some of the further detailed specifications follow:

**Cooling:** Water by all brass centrifugal pump, driven from cam shaft gear.

**Oiling:** Positive plunger forced feed pump, constant level splash system. Oil strained and filtered before entering pump.

**Ignition:** Bosch Dual Magneto.

**Crank Case:** Cast of the best grade of aluminum.

**Cylinders:** High grade, close grained grey iron.

**Crank Shaft:** 35 to 40-point carbon steel, dropped forged in one piece.

**Motor Control:** Levers on steering post and foot pedal.

**Clutch:** 60 h.-p. multiple disc dry plate.

**Speed Changes and Steering Gear:** Steering gear is placed on the left hand side of the car. Control levers in the center. This allows easy access to and from the driver's seat on either side of the car. The gear shift is by a single lever at the right side of the driver.

**Transmission:** 60 h.-p. mounted on jackshaft and sliding gear, selective type, three speeds forward and reverse, and mounted on Hyatt roller bearings.

**Jackshaft and Differential Gear:** 60 h.-p. Made from 40-point carbon steel, heat treated, hardened and mounted on S. K. F. self-alignment, imported ball bearings. Drive from jackshaft is by double chain drive. Drive from clutch to transmission through Feeny-Hurd universal joint, which is dust-proof and oil-tight.

**Steering Gear:** Irreversible type with 18-inch hand wheel.

**Brakes:** One set 14-inch diameter, 3 inches wide, operating direct on rear wheel; one set 12-inch diameter, 3 inches wide, operating on jackshaft. Lined with raybestos.

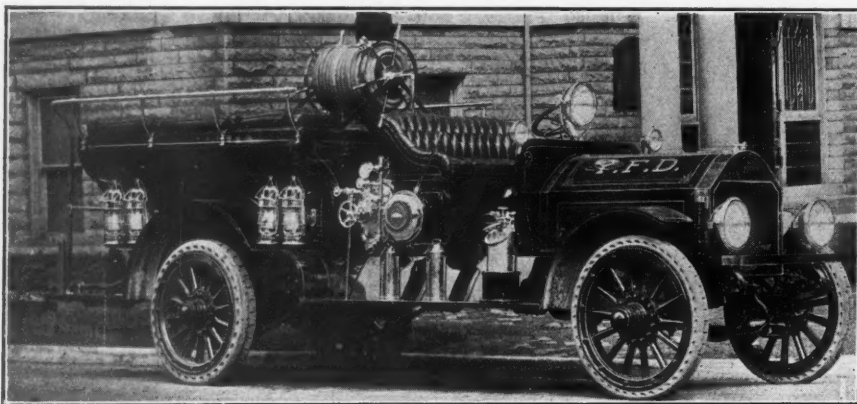
**Springs:** Semi-elliptic both front and rear. Rear springs underslung under rear axle. Made from vanadium steel.

**Front Axle:** I-beam section 1¼x2½ bed. Maximum carrying capacity, 4,000 pounds.

**Rear Axle:** 1¼x2½ rectangular bed. Maximum carrying capacity, 5,100 pounds.

**Bearings:** All Standard taper roller bearings in above axles. Rollers made of nickel steel.

**Wheels:** All artillery type, 36 inches diameter front wheels, with fourteen 2-inch spokes. Rear wheels 36-inches diameter with fourteen 2-inch spokes.



HARWOOD-BARLEY COMBINATION (YANKTON, S. D.)

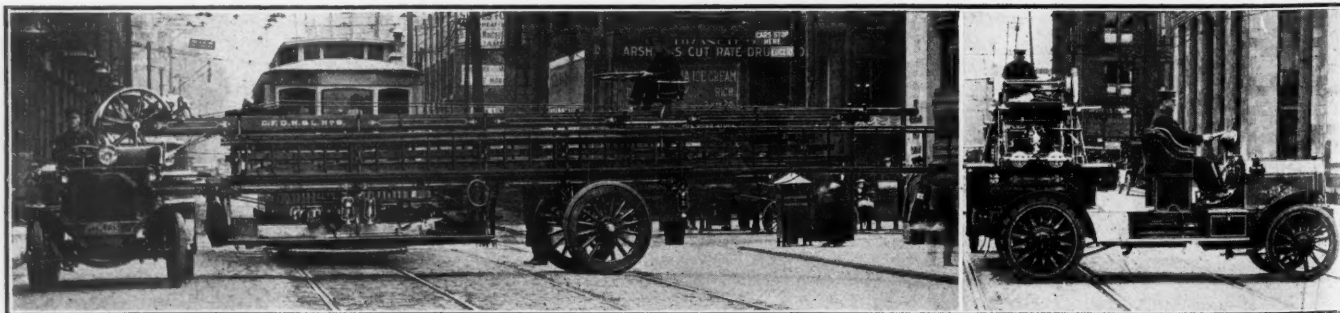
### HARWOOD-BARLEY.

#### Combination for Yankton, S. D.

The Harwood-Barley Mfg. Co., Marion, Ind., has just delivered to the city of Yankton, S. D., a new combination chemical and hose truck. The machine is an "Indiana" type "N" combination. It is equipped with a 45-50 horsepower six cylinder, four cycle engine, head cast in pairs with valves enclosed and mounted in chassis frame in three point suspension. The steering gear is of the reversible type and the machine can make a speed of from 30 to 35 miles an hour. The wheel base is 147 inches. The frame is made of strong channel

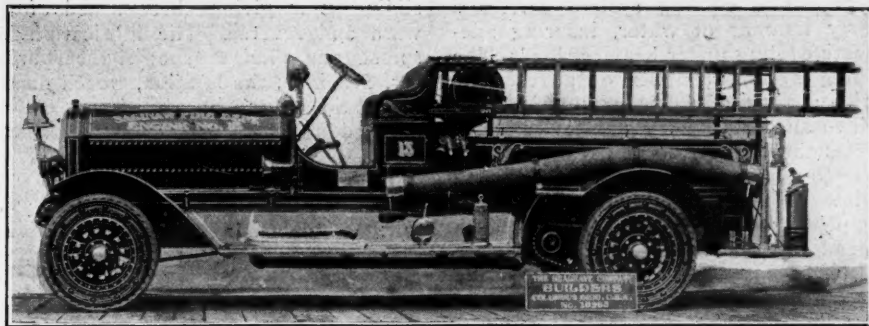
chassis and body is painted a bright red finished in 17 coats and all trimmings are nickel plated.

The machine carries a full fire-fighting equipment including a forty-gallon Holloway soda or chemical tank equipped with 2½ inch hose connection and with additional acid containers. The curved steel hose body has a capacity of 1,000 to 1,200 feet of 2½ inch hose and has under the rear step a tool box. The rest of the equipment includes a three and a six-gallon Babcock hand extinguisher, fire axes, bars, holders, 200 feet of ¾ inch chemical hose in basket, Hoyt shut-off nozzle,



PEERLESS FOUR-WHEEL TRACTOR FOR HOOK AND LADDER.





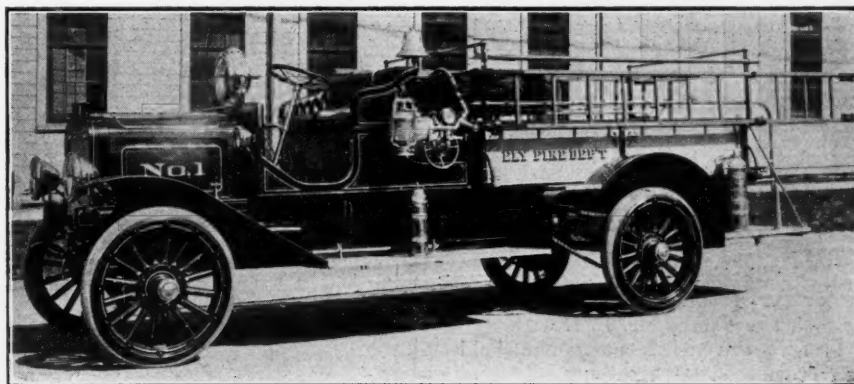
SEAGRAVE COMBINATION PUMP AND HOSE WAGON (SAGINAW, MICH.)

#### SEAGRAVE Combination Pumping Engine and Hose Wagon and Two-Wheel Tractor-Drawn Aerial.

One of the latest designed machines made by the Seagrave Co., Columbus, O., is a combination pumping engine and hose wagon. One of these was made for the Saginaw, Mich., department. The convention will have an exhibit of the new machine. The combination which is illustrated has a wheel base of 175 inches. The Seagrave centrifugal pump is mounted under the driver's seat so that a regular hose body may be located in the usual position. The motor is of special design for this particular engine. It is water-cooled, 6-cylinder, "T" head cylinders and rated 109.3 horsepower. The valves are tungsten steel, and unusually large in diameter. The crankshaft is hand-forged, turned and ground to exact size, made from type "A" vanadium steel and supported by seven large laminated bearings of S A E bearing bronze. The lubrication is by means of a self-contained oiling system from a gear pump in the bottom of crank case which is positively driven from the cam shaft by a vertical shaft through spiral gear. Bosch ignition is used, which includes a two-spark magneto and spark plug. Westinghouse self-starting, lighting and battery ignition are furnished. Power is transmitted through a positive locking clutch to a three speed forward and reverse transmission of standard design similar in construction to that used on other models. All transmission gears are of the stub tooth type. The service brakes are mounted upon the jack shaft on opposite sides of the transmission and brake directly through the drive chain to rear wheels, while the

emergency brake is internal expanding mounted in drums attached to rear wheels.

The pump is driven from a separate transmission which is operated from a shifting lever mounted in conjunction with the gear shift and emergency brake levers on the right hand side.



BROCKWAY COMBINATION (ELY, NEV.)

The Seagrave multiple three-stage turbine pump used is constructed entirely of bronze and has no wearing parts. The non-wearing feature together with the flexibility of this type of pump which allows shut-off nozzles to be operated without imposing any strain upon the motor, are making this design popular. The Seagrave Co. is also placing on the market a new two-wheel tractor, which will be exhibited at the Fire Chiefs' Convention in conjunction with a 75 foot aerial ladder. It is a very powerful piece of machinery and the different units have been crowded into a very small space thereby shortening its length considerably. A four-cylinder "T" head motor is used with 6¾ inch bore and 8 inch stroke.

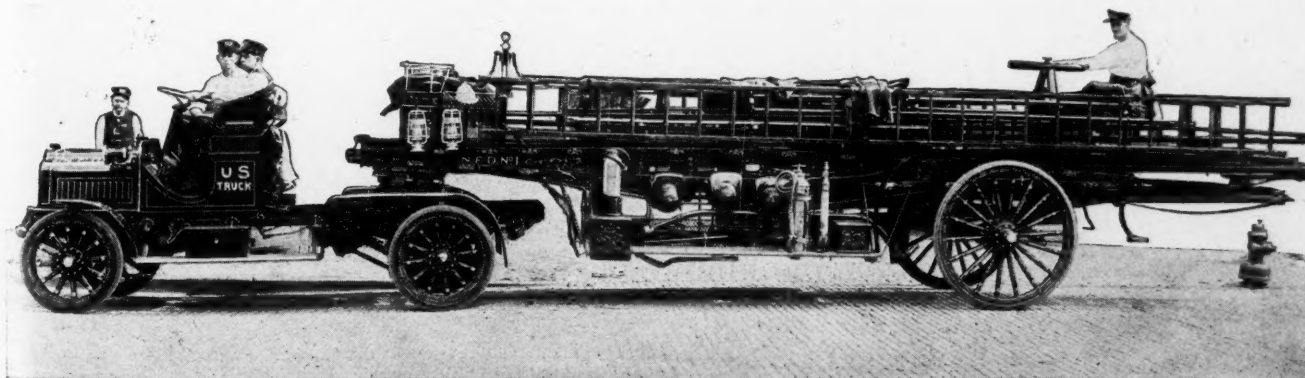
Power is transmitted to a three speed forward and reverse transmission of special design, and through double side chains to a new form of ball joint universal axle.

#### UNITED STATES.

##### Tractor for Hook and Ladder for Covington, Ky.

The city officials of Covington, Ky., after extensive investigation of tractors, were impressed by the tractor installed about a year ago by the fire department of Newport, Ky. They therefore ordered a similar one from the makers, the United States Motor Truck Co., Cincinnati, O. The tractor which is illustrated here is a 4-ton, 50 h. p. machine. The principal claim made for the tractor is the flexible construction of the motor sub-frame and transmission. The maximum speed is 15 miles per hour. The mo-

tor is four-cylinder, cast in pairs and supported by three-point suspension. The standard wheel base is 144 inches. The tires used are 5-inch solid tires, single in front and dual in rear, equipped with Firestone demountable rims. Other important points in design include the three-point suspension of transmission on ball joint and the spring suspension of the motor. The radiator is mounted on springs and there's a spring under the cross-beam over the rear axle to take up excessive load. There is a three-inch angle riveted to the top of the main frame. The drive is left-hand and the control central and through engine to jack shaft the drive is straight line. The wheels are driven by clips around



UNITED STATES TRACTOR FOR HOOK AND LADDER (COVINGTON, KY.)

every spoke. Some further specifications follow:

**Motor:** Cylinders cast in pairs, with integral water jackets. 32.4 H. P. at 1000 ft. piston travel A. L. A. M. rating.

**Carburetor:** Special float feed, warm air jacketed; automatic auxiliary air intake; primary air intake shut-off, to assist starting in cold weather.

**Cooling System:** Positive circulation by centrifugal pump, with radiator and belt-driven fan.

**Ignition:** Jump spark; current supplied by dual magneto and batteries.

**Lubrication:** Splash lubrication from crank case, to which oil is fed by positive pump from reservoir on bottom of crank case.

**Clutch:** Self-contained cone. Spacing is provided to keep clutch cool and clear from dirt and oil.

**Transmission:** Sliding Clutch Type. Gears always in mesh. Three speed forward, one reverse, combined with differential gear, making a countershaft unit within a rigid housing; suspended by three universal ball joints, 5 inches in diameter. No gears in motion when on high speed.

**Wheels:** Front wheels, 35 inches in diameter; rear, 37 inches.

**Springs:** Four semi-elliptical springs.

**Main Frame:** Channel section, rolled steel; all joints riveted. Width of frame, 3 feet 3 inches. Length behind driver's seat, Standard Chassis, 12 feet. Lengthened or shortened to order.

**Steering Gear:** Heavy worm and sliding block gear operated by hand wheel.

**Brakes:** Four, U. S. type Raybestos lined brakes. Service brakes operated by pedals, are contracting and operate on the ends of the countershaft. Emergency brakes are internal expanding, acting on drums on rear wheels and are operated by hand lever.

**Standard Equipment:** Seat, side and rear oil lamps, horn, special wrenches and complete set of tools in tool box, jack, and oil can, Hub Odometer.

#### KISSELKAR.

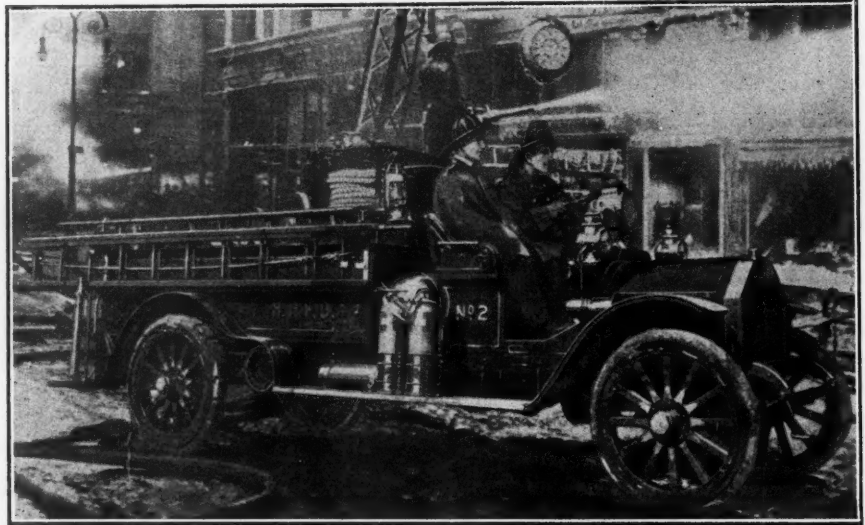
##### Tractor for Hook and Ladder Truck for Patchogue, L. I.

At a recent firemen's tournament held at Riverhead, L. I., there was exhibited a new hook and ladder truck recently placed in service by Patchogue, L. I. The front wheels of the old horse-drawn apparatus were taken off and a tractor, consisting of a 1½ ton Kissel-Kar chassis, made by the Kissel Motor Car Co., Hartford, Wis., attached. At the time it was claimed to be the only motor-driven fire apparatus on Long Island.

The general design of heavy-duty Kissel-Kar trucks brings the major portion of the load over the rear axle and the heavy dual rear wheels. The Kissel-Kar motor is of the simplest T-head

type. The cooling system carries a large amount of water, insuring adequate cooling under heaviest loads. The oiling system consists of a reservoir with a positively driven pump forcing oil to all parts. A special device eliminates the heavy smoking from exhaust due to over-supply of oil. In order to allow of making fast time with an empty truck, the fourth geared-up speed of the Kissel-Kar is so designed as to do this without racing the engine or putting undue strain on the cooling system.

Among the many cities which have Kissel-Kar fire apparatus in service are Marshalltown, Ia.; Edmonton, Alta.; New Orleans, La.; Monroe, La.; Kansas City, and Kankakee, Ill.



FEDERAL CHEMICAL AT WORK.

#### BROCKWAY.

##### Combination Chemical and Hose Truck for Ely, Nevada.

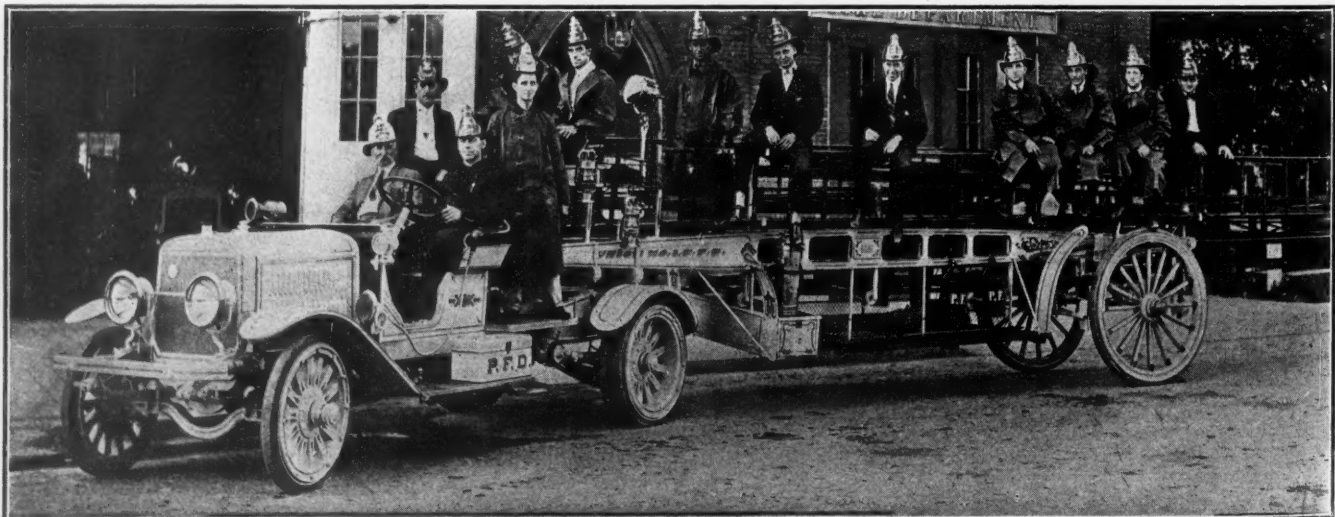
The fire department of Ely, Nevada, has had delivered to it a new combination chemical and hose truck. The machine is a model "V" apparatus made by the Brockway Motor Truck Co., Cortland, N. Y. The motor of the truck is 50 to 60 h.p. continental, four-cylinder, four-cycle, water-cooled. The transmission is Brown-Lipe, selective,

pike pole, crowbar, axes, acid receptacles and 200 feet of chemical hose in hose basket. The whole machine weighs 6,000 pounds and is geared to make a speed of from 30 to 35 miles an hour.

#### HOWE-FEDERAL.

##### Double and Triple Combinations.

The Howe Federal auto fire engines for smaller cities and towns are designed to give reliability and ability to work rather than high speed or high



KISSELKAR TRACTOR FOR HOOK AND LADDER (PATCHOGUE, L. I.)

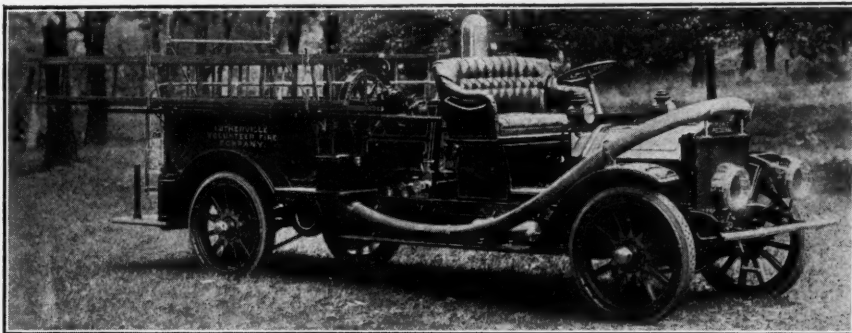


power. These machines combine the Federal truck made by the Federal Motor Truck Co., Detroit, Mich., and the Howe triplex piston pump fire engine made by the Howe Engine Co., Inc., Indianapolis, Ind. The claim is made for these engines that two may be obtained for the price of one large apparatus and that therefore there is less danger of being rendered defenseless by a breakdown of the large machine. The capacity of the engine is 350 gallons per minute.

The Howe Triplex piston pump is claimed to be simple, easily operated and easily repaired. It is connected by a sprocket driven by a "winch" gear in the transmission and may be put into commission by throwing the gear

Radiator—Cellular, suspended between coiled springs.  
Drive—Clutch to transmission, shaft; jackshaft to wheels, chains.  
Clutch—Pressed steel cone, leather-faced.  
Transmission—Selective sliding gear. Three speeds forward and reverse.  
Jackshaft—Floating.  
Gasoline—18 gallons.  
Brakes—Both sets expanding.  
Frame—Pressed steel, 7/32-inch thick; 4½-inch side rails, narrowed in front.  
Wheels—36-inch, wood, S. A. E.  
Tires—36-inch by 4-inch, front; 36-inch by 5-inch rear. Swinehart Cellular.  
Steering Gear—Irreversible type; 18 inches, bolted on hand wheel.  
Control—Steering gear on left, levers in center.  
Wheelbase—144 or 120 inches.  
Tread—56 inches front, 59½-inch rear.  
Equipment—Three oil lamps, horn, oil can, jack and tools, searchlight and Prest-O-Lite tank.

The other machine illustrated is a fully-equipped Federal 30 h. p. chemical wagon at work.



HOWE-FEDERAL COMBINATION PUMP.

on neutral and shifting a lever. The pumps have phosphor-bronze spring packings in the pistons which automatically take up the wear and the pistons operate in seamless drawn brass cylinders. The machine will go at a speed of 25 miles an hour carrying 1,000 feet of hose and 8 to 10 men. The apparatus is built as a double combination pumping engine and hose wagon furnished with a 40-gallon chemical tank and hose carrier; as a triple combination pumping engine, hose wagon and chemical; similar machines with a hose body and chemical tanks or as a hose wagon.

The Federal fire chassis has a 4-cylinder monobloc "L" head 30 h.p. motor giving a speed of 22 miles per hour. Some of the specifications of the Federal 3,000-pound chassis follow:

Ignition—Elsemann high tension magneto, double system and batteries.  
Motor Lubrication—Constant level splash; pump circulated.

#### NOTT.

##### Hose Wagon for Victoria, B. C.

The Nott Fire Engine Co., Minneapolis, Minn., has sold to the Fire Department of Victoria, B. C., a hose wagon of rather unusual design. The machine has been bought by Chief Tom Davis for \$7,000 and is now in service for wharf and dock fires. The wagon holds only hose—2,800 feet of 2½-in. hose—and has no equipment of extinguishers, chemical tanks or ladders. It will also hold twelve men.

The motor of the apparatus is of the six-cylinder latest improved T head type and dome head construction in all pistons and cylinders. The motor is guaranteed to increase in horsepower up to 1,600 revolutions per minute and at no time to exceed 900 revolutions in traveling 60 miles per hour. The oiling system is both positive force feed and splash system. The crank shaft is bored hollow and the oil is

furnished through it to all bearings at 20 to 25 pounds pressure. On the pumping engine there are three oiling systems: Force feed, splash and positive hand pump—the latter in case of failure of the other two. In place of the balance wheel is the U. S. Lighting & Heating Co.'s lighting and starting system. This is positive acting and guaranteed to give the motor 300 revolutions per minute. The wheels are made of disc steel claimed to have half the weight and five times the strength of wooden wheels. The machine is equipped with the English worm drive. The radiator is of the genuine Mercedes racing car type.

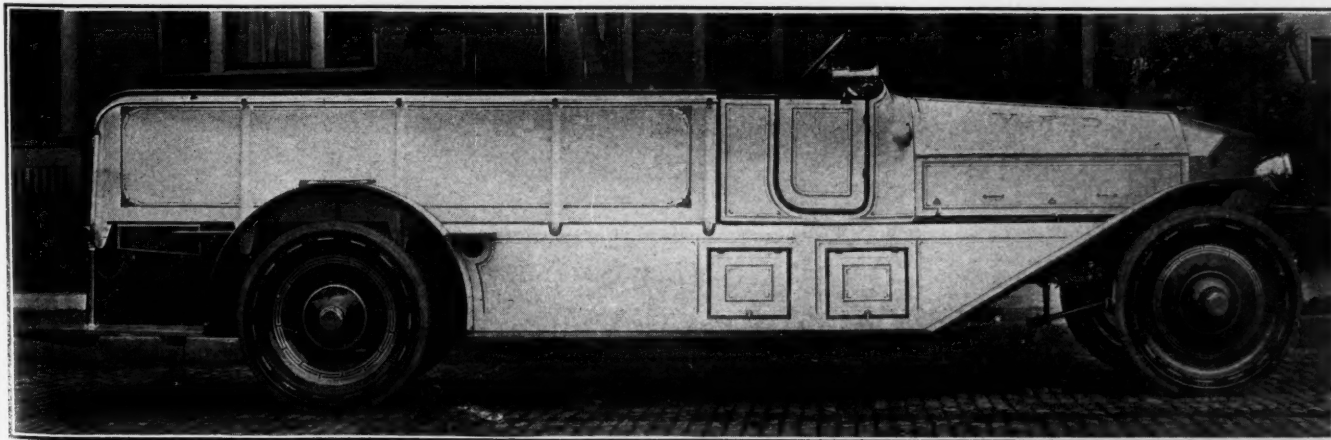
A similar machine to this is built as a combination chemical or as a triple combination—in the latter case with a heavier frame, heavier axles and wheels and larger tires. In the triple combination with a positive pump the worm drive is used to transmit power from the engine to the pump. The Victoria apparatus is shown in the accompanying illustration.

#### COUPLE GEAR.

##### Tractors for Steamers for Trenton, N. J.

Gasoline-electric traction for steam fire engines is the rather unusual problem worked out by the Couple Gear Freight Wheel Co., Grand Rapids, Mich., for the Trenton, N. J., fire department. Two gasoline-electric, two-wheel drive tractors, the first of their type, although couple gear is in extensive fire department use, were sold to Trenton by the Municipal Equipment Co., Weightman Bldg., Philadelphia, Pa., and were attached to an extra first size metropolitan steamer and a second size metropolitan. The two machines, with the chief's car, are shown in front of headquarters, in the illustration.

The drive consists of a 70 h. p. gasoline engine direct connected to an electric generator specially designed to give the flexibility necessary in this type of construction. The control is through a three-point electric controller of the street railway type which allows the same number of speeds forward and reverse. A feature of this controller is the electric brake which converts the electric motors into generators, sending the current into a



NOTT HOSE WAGON (VICTORIA, B. C.)



controlled resistance grid by means of which the loading of the motors may be increased to the braking point required to stop the machine. The ordinary operation is simply through the controller handle which eliminates gear and clutch levers and gear shifting so that the driver may use both hands for steering and may operate the foot throttle independently of the hand throttle. When the throttle is released, it automatically closes, slowing down the engine to a point where the power is insufficient to generate current.

The construction of the wheels which is illustrated here, consists of an electric motor having a normal rating of horse power with a 200 per cent. overload capacity. The armature lies across the wheel and has a finish on each end which engages in a gear or rack on the rim. This gives a lifting or pulling effect. The transmission of efficiency through these gears is claimed to be 97.5 per cent. according to government tests. In official tests under Chief Bennett and Assistant Chief Stackhouse of the Trenton tractors they showed a speed of 21 miles per hour. On hill-climbing tests the machines made 10 miles per hour from a standing start.

#### ROWE.

##### Combination Chemical and Hose Wagon for Ventnor City, N. J.

A combination chemical and hose wagon has been the service of Ventnor

City, N. J., fire department for over a year and has given excellent service to the satisfaction of Captain David G. Stuart. This machine was made by the Rowe Motor Mfg. Co., Downingtown, Pa. The apparatus is equipped with a 60-gallon chemical engine and will hold 800 feet of 2½ inch hose. The speed of the machine is 25 miles an hour.

The engine is four-cylinder, vertical, water-cooled. The crank shaft is made of specially heat-treated steel. The crank case consists of a single aluminum casting as an upper half. Lubrication is by means of a gear pump. The

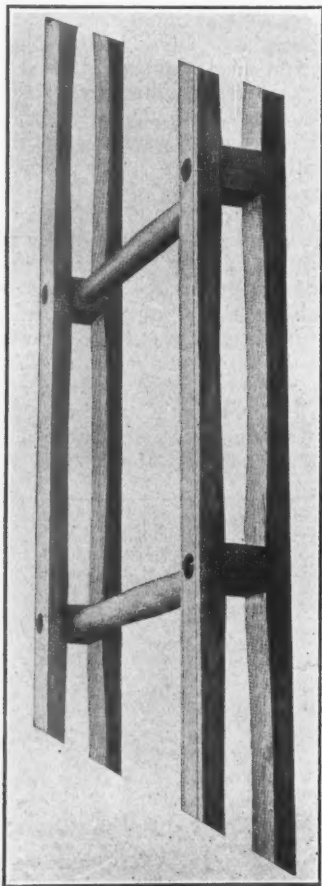


ROWE COMBINATION (VENTNOR CITY, N. J.)

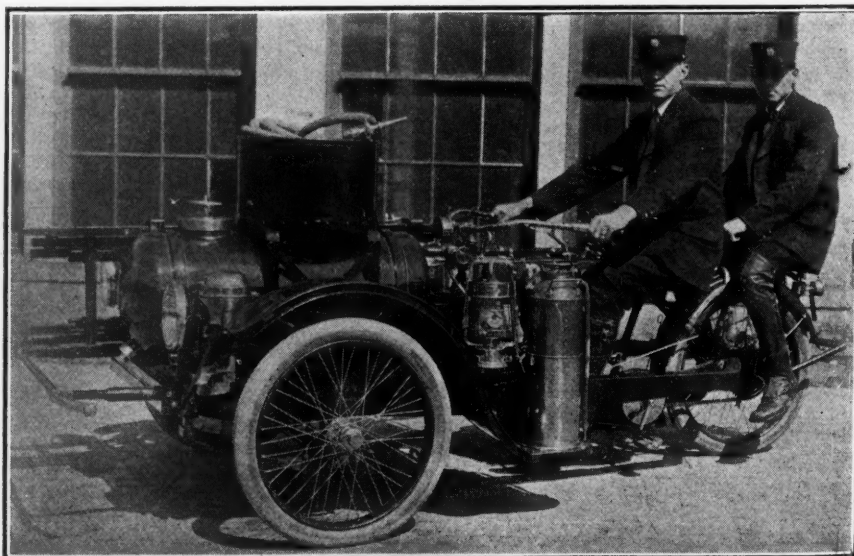
ignition is Bosch dual magneto and the carburetor of the Reyfield automatic type. Cooling is accomplished by means of a centrifugal pump directly coupled to the engine gears which forces water through engines to a large honeycomb radiator. The clutch is of the disc type and the transmission, three speed selective—three forward and one reverse. The drive is of the worm type. There are two independent braking systems. The whole design is calculated for service and durability.

#### A TRUSSED LADDER.

One of the exhibits at the New Orleans Convention will be a Pirsch Patent Trussed Ladder. This ladder, which is illustrated in the accompanying cut, has been in extensive use in many fire departments. The makers claim that this ladder can be climbed on either side. The burning of the ends, it is claimed, will in no way weaken the ladder and the construction makes the apparatus strong and light. The trussed ladder is made by Peter Pirsch & Co., Kenosha, Wis.



PIRSCH PATENT TRUSSED LADDER.

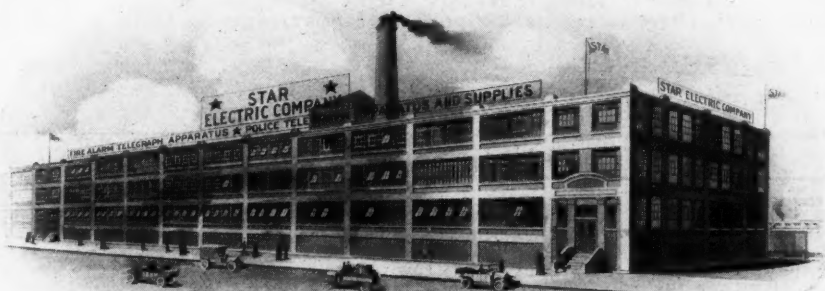


DAVIS CHEMICAL TRICYCLE.

## INDUSTRIAL NOTES

**Cast-Iron Pipe.**—Chicago.—No orders of consequence. Quotations: 4-in., \$26; 6 to 12-in., \$24; 16-in. and up, \$23.50. Birmingham.—Number of orders quite good. Quotations: 4-in.,

Iron Pipe from mine to test. The booklet is illustrated with instructive photographs showing the care taken in every process to make a product of quality.



THE NEW HOME OF THE STAR ELECTRIC CO. AT NEWARK, N. J.

\$20; 6-in. and up, \$18. San Francisco—Los Angeles has taken bids on 750 tons and Pasadena is in the market for about 150 tons. Quotations: 4-in., \$34; 6-in. and over, \$32. New York.—No important municipal lettings. Quotations: 6-in., \$20 to \$20.50.

**Lead.**—Quotations: New York, \$3.75; St. Louis, \$3.575.

**A. M. Byers Co.,** Pittsburg, Pa., is offering for distribution a very interesting booklet describing in detail the process of making Byers Wrought

**The Star Electric Company.**—Fire and police department officials all over the world will be interested in the news that the city of Binghamton is no longer identified with the manufacture or sale of Star Electric Fire and Police apparatus. The entire business of the Star Company has been transferred to commodious quarters in the new home shown in the illustration. An official of the company states that the rapid growth of the company's business made this change necessary. It has for some time taxed the capacity of the

over four times the capacity and floor space of the old plant at Binghamton. The general offices, aside from the New York offices, 42d Street Building, and the western department, which is still in charge of Frank C. Stover, Peoples Gas Building, Chicago, are located in this new building, 646 Frelinghuysen avenue, Newark, N. J.

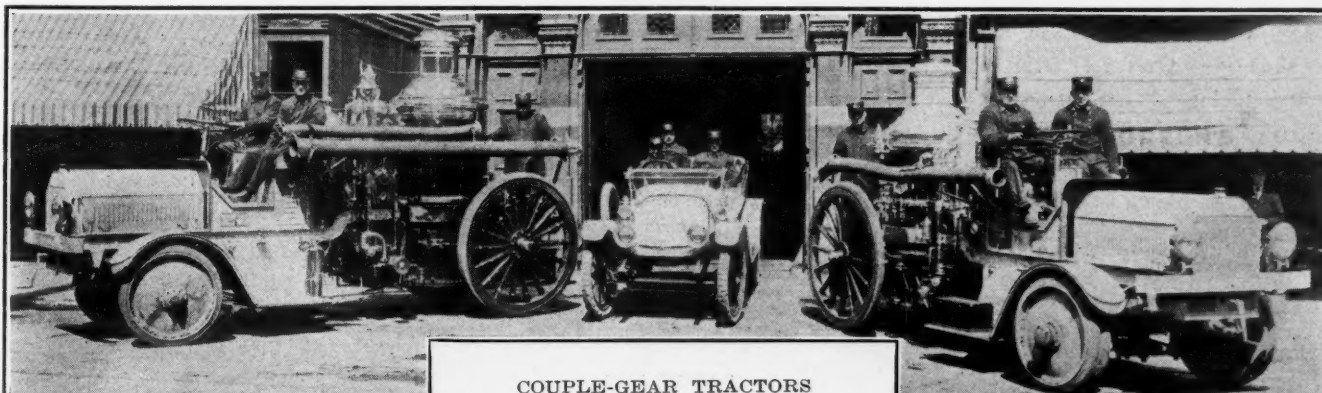
### NEWS OF THE SOCIETIES.

(Continued from page 529.)

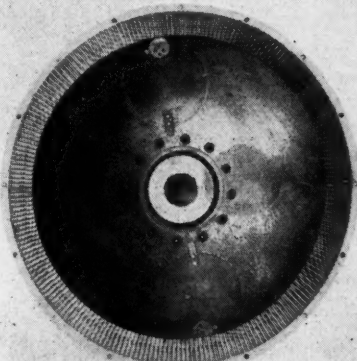
inaugurated by the American Highway Association and now in practical operation by the U. S. Office of Public Roads. Despite the general impression which exists to a certain extent in other sections of the country that the south is backward in the use of modern road building methods, Fulton County, Georgia, of which Atlanta is the county seat, is planning to show the delegates actual samples, completed or in course of construction of every known type of road adapted to modern traffic conditions.

An interesting comparison of results accomplished by the various states and their subdivisions will be afforded by the series of models, maps and materials which will comprise respective state exhibits. The New York Highway Department is planning an exhibit of such striking proportions and comprehensiveness as will rival even the remarkable series of models to be shown by the Federal Government. Temporary structures are now being prepared to house the overflow of exhibits which are to extend from the auditorium a distance of three entire city blocks.

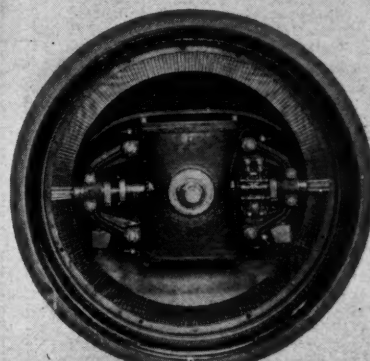
(Continued on page 34)



COUPLE-GEAR TRACTORS  
(Trenton, N. J.).



INTERIOR OF COUPLE-GEAR WHEEL.



MOTOR IN COUPLE-GEAR WHEEL.

Binghamton factory to meet the demand for the newer types of Star apparatus. This official also states that on top of a 300 per cent. increase this year, the company's success in securing the contract to equip the entire Panama Exposition with Star fire and police apparatus, proved an unexpected advertising stimulus. Confronted with the problem of either immediately tripling the capacity at Binghamton or building a new factory where conditions were better suited to the growth and development of the business, it was finally decided that the latter course was best. The new factory which the company now occupies has



# ADVANCE CONTRACT NEWS

## ADVANCED INFORMATION BIDS ASKED FOR

## CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Ind., Indianapolis	10 a.m., Oct. 10.	10..	Gravelling and macadamizing two highways.....	F. M. Williams, Delaware Co. Aud.
Ind., Valparaiso	10 a.m., Oct. 10.	10..	Grading, paving and improving road in one township....	C. A. Blachly, Co. Aud.
Ind., Crown Point	1 p.m., Oct. 10.	10..	Gravel road in one township.....	Co. Comrs.
Ind., Muncie	10 a.m., Oct. 10.	10..	Grading, graveling and macadamizing road.....	Comr. Delaware Co.
N. J., East Orange	8 p.m., Oct. 12.	12..	Paving sidewalks.....	Lincoln E. Rowley, City Clk.
Ind., Hammond	10 a.m., Oct. 12.	12..	Cement sidewalks.....	Board Public Works.
Wash., Seattle	2 p.m., Oct. 12.	12..	Constructing one street.....	County Engineer.
Ind., Greensburg	1 p.m., Oct. 12.	12..	Crushed stone road in Sand Creek Township.....	Co. Comrs.
Pa., Allentown	5 p.m., Oct. 12.	12..	Furnishing road asphalt or refined Bermuda asphalt, in barrels and carload lots.....	Bascom & Sieger, Twp. Engrs.
O., Youngstown	10 a.m., Oct. 12.	12..	Grading one road.....	County Comrs.
O., Sandusky	1.30 p.m., Oct. 12.	12..	Improving 2,945 ft. road to cost about \$2,260; also placing creosote floor on bridge.....	H. M. Adams, Aud., Erie Co.
Ind., Brazil	10 a.m., Oct. 12.	12..	Constructing new cement walk.....	E. A. Staggs, Aud.
Minn., New Ulm	10 a.m., Oct. 12.	12..	Tiling, culverts and bridges.....	L. G. Vogle, Brown Co. Aud.
Ia., Anamosa	6 p.m., Oct. 12.	12..	15,000 sq. yds. paving, also guttering and curbing.....	C. V. Fisher, City Clk.
Minn., St. Paul	10 a.m., Oct. 12.	12..	Curbing.....	A. Hohenstein, Pur. Agt.
Tex., Houston	10 a.m., Oct. 12.	12..	Hauling, spreading and gravel, ditching and construction.....	H. L. Washburn, Harris Co. Aud.
Idaho, Lewiston	.....	Oct. 12..	Paving a number of roads requiring 27,000 sq. yds. light bitulithic and 36,000 sq. yds. oil macadam.....	County Comrs.
Ind., South Bend	10 a.m., Oct. 13.	13..	Constructing pavement on one street.....	Board Public Works.
O., Youngstown	Noon, Oct. 13.	13..	Retaining walls and sidewalks.....	Director Public Service.
Cal., Oakland	10 a.m., Oct. 13.	13..	Repairing a number of bridges.....	J. P. Cook, Clk. Bd. Sup.
Ala., Ozark	11.30 a.m., Oct. 14.	14..	Grading, draining and sandclaving road.....	Court of Comrs.
Ky., Louisville	.....	Oct. 14.	Paving with granite blocks, \$15,000.....	Board Public Works.
O., Napoleon	Noon, Oct. 14.	14..	Paving Main St.....	Harry C. Rich, Village Clk.
Ind., Mt. Vernon	2 p.m., Oct. 15.	15..	9,500 ft. of road improvements.....	Comrs. Posey Co.
O., Sandusky	1.30 p.m., Oct. 15.	15..	6,500 ft. macadam road, 6,336 ft. macadam road, and 9,783 ft. macadam road.....	H. M. Adams, Co. Aud.
Ind., New Albany	8 p.m., Oct. 15.	15..	Curbing streets and alleys, construction of gutters and sidewalks.....	Board Public Works.
Ill., Springfield	11 a.m., Oct. 15.	15..	Construction of two sections of highways.....	Co. Hwy. Supt.
O., Sandusky	1.30 p.m., Oct. 15.	15..	Constructing 22,583 ft. macadam, cost about \$23,500.....	County Comrs.
N. Y., Albany	1 p.m., Oct. 15.	15..	Improving roads in 23 counties, aggregating about 130 miles.....	J. M. Carlisle, Comr.
O., Sandusky	.....	Oct. 15..	About 16,000 ft. macadam road 16 ft. wide.....	State Highway Comr., Columbus, O.
O., Cincinnati	Noon, Oct. 16.	16..	Constructing roads in three townships.....	A. Reinhardt, Clk.
Minn., Morris	10 a.m., Oct. 16.	16..	Construction of turnpiking.....	F. E. Welr, Aud.
O., Cincinnati	Noon, Oct. 16.	16..	Improvement of road.....	Albert Reinhardt, Clk.
Ind., Spencer	2 p.m., Oct. 17.	17..	Grading, paving and improving road.....	G. W. Stwalley, Aud. Owen Co.
N. Y., Binghamton	.....	Oct. 17..	Construction of curb and gutters.....	Board Contract & Supply.
N. C., Asheville	.....	Oct. 17..	Grading and resurfacing with bituminous binders.....	C. A. Neal, Co. Engr.
Cal., Los Angeles	2 p.m., Oct. 19.	19..	Macadamizing county road.....	Bd. Co. Suprs.
Ind., Vincennes	.....	Oct. 19..	Laying sidewalks.....	City Clerk.
Wash., Calumet	.....	Oct. 19..	Constructing sewers.....	Town Council.
Minn., Duluth	10 a.m., Oct. 19.	19..	Grading, paving and improving alley.....	C. S. Palmer, City Clk.
O., Dayton	10 a.m., Oct. 20.	20..	Completing bridge and roadway.....	W. S. Asling, Sec. Co. Comrs.
O., Green Springs	.....	Oct. 20..	8,000 yds. paving.....	Fred Reid, Clk.
O., Dayton	10 a.m., Oct. 20.	20..	Excavation, grading and macadamizing.....	W. H. Aszling, Secy.
O., Cincinnati	Noon, Oct. 23.	23..	Widening of Drake Ave. and repair of Hooben road.....	Albert Reinhardt, Clk.
O., Cincinnati	Noon, Oct. 23.	23..	Improving and widening certain streets, also repairing.....	P. Fosdick, Dir. P. S.
Ind., Monticello	10 a.m., Oct. 26.	26..	Grading, draining and improving road in one township.....	A. G. Fisher, Co. Aud.
SEWERAGE.				
Ark., Texarkana	11 a.m., Oct. 10.	10..	Drainage canals and laterals.....	L. Kirkland, Chr. Drain. Dist.
R. I., Pawtucket	.....	Oct. 10..	Construction of concrete and tile sewer.....	Jenks & Ballou, Providence.
N. D., Bismarck	8 p.m., Oct. 12.	12..	Construction of lateral sewers.....	R. H. Thistlewaite, City Aud.
Mich., Bay City	9 a.m., Oct. 12.	12..	Furniture material and construction of sewer.....	Board Public Works.
Minn., Duluth	Noon, Oct. 12.	12..	Sewers and Sewage disposal plant.....	Elmer F. Blu, Atty.
O., Columbus	Noon, Oct. 12.	12..	Motor driven centrifugal pumping machinery for sewerage station to include pumps from 5 to 15 million gallons capacity.....	S. A. Kinnear, Dir. Pub. Ser.
Ind., Hartford City	2 p.m., Oct. 12.	12..	Open drain and tile drain.....	G. Warren, Sup. Con., Munsey.
Ia., Grinnell	7.30 p.m., Oct. 12.	12..	Constructing 12% miles 8 to 22-in. sewers, with sedimentation tank and sand filters.....	A. C. Harriman, City Clk.
Minn., Proctor	Noon, Oct. 12.	12..	25,000 ft. vitrified pipe sewer and disposal plant.....	E. C. Erickson, Pres.
Minn., St. Paul	10 a.m., Oct. 12.	12..	Sewers on Wentworth Ave. and Fulton St.....	August Holmstein, Pur. Agt.
Wis., Beaver Dam	7.30 p.m., Oct. 12.	12..	Sewer and surface water sewer.....	Board Public Works.
La., Shreveport	10 a.m., Oct. 13.	13..	Storm sewer.....	L. H. Baker, Secy.
Ind., South Bend	.....	Oct. 13..	3,000 ft. sewer.....	H. P. Perley, City Clk.
Conn., Waterbury	8 p.m., Oct. 13.	13..	Construction of sewers.....	R. A. Cairns, City Engr.
Ind., South Bend	10 a.m., Oct. 13.	13..	Trunk and pipe sewers.....	Board Public Works.
Ia., Clinton	8 p.m., Oct. 13.	13..	1,110 ft. 18-inch vitrified sewer pipe, etc.....	F. W. Leedham, City Clk.
Ind., South Bend	10 a.m., Oct. 13.	13..	Constructing trunk and pipe sewers.....	Board Public Wks.
O., Napoleon	Noon, Oct. 14.	14..	Construction of 12-inch sewer.....	Harry C. Rich, Vil. Clk.
Ala., Camp Hill	.....	Oct. 15..	Construction of sewer system.....	W. C. Newell, Mayor.
Wash., Spokane	abt Oct. 15.	15..	Constructing steel and conc. sewer to cost about \$19,000.....	M. Macartney, City Engr.
Ia., Knoxville	1.30 p.m., Oct. 15.	15..	Constructing ditch, length about 6 miles.....	W. O. Price, Constr. Engr.
Fla., Miami	7.30 p.m., Oct. 15.	15..	18 miles 8 to 24-inch sanitary sewers.....	Mayor.
Mich., Marshall	About Oct. 15.	15..	Six miles of drain and two bridges; cost about \$8,000.....	Co. Commission.
Wis., Delavan	8 p.m., Oct. 16.	16..	500 to 1,000 ft. concrete lined ditch.....	D. J. Doan, City Clk.
Minn., Albert Lea	.....	Oct. 16..	10,772 ft. 10 to 24-inch clay tile.....	R. G. Lingdren, Engr.



## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
N. J.	Elizabeth	5 p.m., Oct. 16.	50,000 ft. of ditches	County Mosquito Extermination Com.
N. J.	Atlantic City	Oct. 20.	85,000 ft. ditching	Thos. J. Headley, Ex. Off.
S. C.	Charleston	10 a.m., Oct. 20.	1,400 ft. clay and tile pipe	Bureau Supplies & Accounts, Washington, D. C.
Ind.	South Bend	10 a.m., Oct. 20.	Pipe sewer	Board Public Works.
La.	New Orleans	Noon, Nov. 14.	Sewer extensions, water extensions, connections to sewers and water mains, etc.	F. S. Shields, Sec. Sew. & Water Board.

## WATER SUPPLY

Cal.	San Francisco	10 a.m., Oct. 10.	Water distributing system	Lieut.-Col. W. H. Hart.
O.	Wooster	Oct. 10.	One million gallon steel reservoir	Max Blumberg, Dir. P. S.
Utah	Ogden	Oct. 12.	Developing system of artesian wells	City Comrs.
Ill.	Oglesby	8 p.m., Oct. 12.	Artesian well, about 1,650 ft. deep	J. Corgiat, City Clk.
La.	Ankeny	8 a.m., Oct. 12.	Water works system, to cost \$12,000	J. C. Marts, Mayor.
Va.	Petersburg	4 p.m., Oct. 13.	Building filtration plant complete	W. F. Drewry, Supt. Central State Hosp.
Minn.	Tracy	8 p.m., Oct. 13.	Water mains	C. M. Campbell, City Rec.
Ill.	Chicago	11 a.m., Oct. 13.	Water supply pipe	Board Local Improvements.
O.	Cleveland	Noon, Oct. 14.	Superstructure for filters and gate house	A. R. Callow, Comr. P. & Sup.
Ala.	Camp Hill	Oct. 15.	Water works and sewer system	W. C. Newell, Mayor.
Pa.	Pittsburgh	Oct. 15.	Furnishing and laying steel c-i. pipe lines	City Comptroller.
O.	Middletown	Oct. 15.	Repairing power pump, and delivering one water power operated pump	Pollard & Ellms, Engrs., Cincinnati.
Neb.	Lincoln	2 p.m., Oct. 15.	Water and light machinery; cost about \$15,000	T. H. Berg, City Clk.
N. Y.	Lyons	Oct. 17.	C-i. pipe and special castings for water works system, being approximately 13 1/2 miles for 6, 10 and 12-in. pipe	Village Clerk.
H. T.	Honolulu	3 p.m., Oct. 27.	Constructing concrete water tower, tank, etc.	O. Wenderoth, Superv. Arch., Washington, D. C.
S. C.	Mullins	Oct. 29.	Constructing water works and sewerage	G. C. White, Engr., Charlotte, N. C.
Kan.	Little River	About Nov. 1.	Constructing water system, cost \$25,000	W. B. Rollins, Cons. Engr., Kansas City, Mo.

## LIGHTING AND POWER

O.	Columbus	Noon, Oct. 12.	Furnishing motor driven centrifugal pumping machinery	S. A. Kinnear.
Australia	Melbourne	Oct. 14.	Furnishing and delivering low tension cables and instruments, also fuses, etc.	P. McBride, Agent, Gen., Victoria Melbourne Place, London, E. C.
Neb.	Lincoln	Oct. 15.	Improvements to light and water plant	T. H. Berg, City Clk.
Neb.	Lincoln	Oct. 15.	Machinery for electric light plant	Thos. H. Berg, City Clk.
N. Y.	New York	Oct. 22.	Conduit and wiring system and lighting fixtures	O. Wenderoth, Wash., D. C.
N. Va.	Wheeling	Oct. 26.	Furnishing water turbines and air compressors	J. P. Jervey, Con. Engr.
Australia	Sydney	Oct. 26.	Supplies delivered and erection of wet air filters	Municipal Council.

## FIRE EQUIPMENT

D. C.	Washington	10.30 a.m., Oct. 10.	Auto hose cart	Asst. Pur. Agt., 24 State St., N. Y. City.
D. C.	Washington	Oct. 10.	Automobile hose car	Mag. F. C. Boggs, Pur. Agt.
Minn.	St. Paul	10 a.m., Oct. 12.	5,000 ft. 2 1/2-in. rubber hose	Aug. Holstein, Pur. Agt.
Ont.	Toronto	Oct. 31.	Supplies and fire alarm equipment	H. C. Hocken, Mayor.

## BRIDGES

R. I.	Cumberland	Oct. 10.	Reinforced concrete arch bridge faced with granite or steel construction	H. F. Stein, Con. Engr., Pawtucket.
R. I.	Central Falls	Oct. 10.	Bridge across Blackstone River	H. F. Esten, 18 East Ave., Pawtucket.
Ind.	Lebanon	1 p.m., Oct. 12.	22-ft. span bridge, about \$500	Comrs. Boone Co.
Minn.	New Ulm	10 a.m., Oct. 12.	Culverts and bridges for state highway	Lewis C. Bogel, Aud.
Fla.	Jacksonville	7.30 p.m., Oct. 12.	Erecting a reinforced concrete bridge	G. M. Powell, Chm.
N. C.	Fayetteville	Oct. 12.	Constructing a number of concrete bridges to cost about \$30,000	F. R. Hall, Clk. Bd.
N. J.	Camden	8 p.m., Oct. 12.	Reinforced concrete culvert	J. A. Stow, Clk., and Pensauken Twp.
Ga.	Watkinsville	Oct. 12.	Steel for bridges	F. R. Booth.
Kan.	Scott	h. Oct. 12.	Six double stone arches and five concrete slab bridges	County Clerk.
N. C.	Fayetteville	Oct. 12.	Constructing several concrete bridges, probable cost \$25,000	County Comrs.
Pa.	Lebanon	8 a.m., Oct. 13.	Repair of wing walls on iron bridge	Co. Comrs.
N. J.	Camden	10 a.m., Oct. 14.	Material for bridge	L. W. Gercke, Chmn.
O.	Cleveland	Noon, Oct. 14.	Cantilever bridge	A. R. Callow, Comr.
O.	Dayton	Oct. 15.	Materials and labor for bridge	Walter H. Aszling, Secy.
O.	West Carrollton	Oct. 15.	Constructing bridge over canal	County Comrs.
Ind.	Dayton	10 a.m., Oct. 15.	Constructing superstructure of bridge	W. H. Aszling, Sec. Co. Comrs.
Ind.	Richmond	11 a.m., Oct. 17.	Culverts and bridges	L. S. Bowman, Aud. Wayne Co.
O.	Bellaire	1 p.m., Oct. 19.	Reinforced concrete bridge	Emerson Campbell, Aud.
Ga.	Rome	Noon, Oct. 19.	Concrete bridge	K. Lindsey, Lloyd Co. Engr.
Pa.	Pittsburgh	Noon, Oct. 20.	Steel girder bridge	R. J. Cunningham, Co. Cont.
Minn.	Rochester	10 a.m., Oct. 20.	Steel for bridge	L. J. Fiegel, Aud.
Ga.	Danielsville	Oct. 21.	Steel bridge over Broad River	J. W. Draper, Supt. Rds.
O.	Lima	Noon, Oct. 21.	Completing superstructure of bridge	H. J. Lawlor, Clk. of Bd.
Minn.	Shakopee	11 a.m., Oct. 21.	State Bridge No. 1277	A. J. Mayer, Aud.
Tenn.	Chattanooga	10 a.m., Oct. 22.	Constructing one bridge	Tennessee River Bridge. Com.
G.	Marietta	Noon, Oct. 23.	Substructure or masonry of bridge	W. B. Alexander, Co. Aud.
G.	Cincinnati	Noon, Oct. 23.	Constructing concrete arch bridge	Board Co. Comrs.
G.	Xenia	11.30 a.m., Oct. 23.	Truss steel bridge across Bear Branch	G. W. Kemble, Clk.
G.	Marietta	Noon, Oct. 23.	Masonry for bridge	W. B. Alexander, Aud.
Ind.	Indianapolis	10 a.m., Oct. 24.	Repairs to bridge	W. T. Patten, Aud.
N. J.	Perth Amboy	2.30 p.m., Oct. 26.	Construction of concrete and steel bridge	Board Chosen Freeholders.
Me.	Portland	Noon, Oct. 26.	Bridge between Portland and South Portland	Cumberland Co. Comrs.
La.	New Orleans	Oct. 26.	Trunnion bascule lift bridge	A. G. Ricks, Comr.
Kan.	Ottawa	Oct. 29.	Concrete bridge	J. E. Rose, Aud.
Kan.	Ottawa	Oct. 29.	Constructing stone pier substructure and one concrete abutment of bridge	J. E. Rose, Co. Aud.
Me.	Portland	Nov. 2.	Constructing bridge	County Comrs.

## MISCELLANEOUS.

O.	Oak Harbor	Noon, Oct. 10.	Armory building	State Armory Bd., Columbus.
V.	Norfolk	Oct. 10.	Hiring carts and teams for sanitary work	Co. Bd. Health.
T. L.	Wilmington	Oct. 11.	Supplying items for new county and city building	Bldg. Commission.
N. J.	West New York	Oct. 13.	\$75,000 municipal building	James L. Wolfe, Clk.
Ill.	Aurora	11 a.m., Oct. 14.	\$35,000 armory	F. D. Whipp, Supv., Springfield
Mass.	Boston	Oct. 14.	Refuse receiving stations	Pub. Works Dept.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Kan.	Alma	6 p.m., Oct. 15	Erecting City Hall	Mayor and Council.
D. C.	Washington	2 p.m., Oct. 15	Collection and disposal of garbage, etc.; optional period.	District Comrs.
Pa.	Philadelphia	Oct. 16	Garbage disposal	Morris L. Cook, Dir. Pub. Wks.
N. Y.	Albany	Noon, Oct. 20	Improving Cayuga and Seneca Canal	D. W. Peck, Supt. P. Wks.
Del.	Wilmington	11 a.m., Oct. 20	Materials for county and city building	Thos. F. Gormley, Clk.
Tex.	Corpus Cristi	Nov. 3	Constructing garbage crematory or incinerator	City Clk.
Va.	Norfolk	Jan. 16	150 ton capacity floating revolving crane; cost, about \$450,000	Bur. Yds. & Docks, Navy Dept., Wash., D. C.

## STREETS AND ROADS

**Pasadena, Cal.**—East Orange Grove Ave., from Lake Ave. to east city limits, is to be graded and paved with four-inch macadam. Resolution of intention has been introduced at meeting of city commissioners.

**Sacramento, Cal.**—Bond issue of \$2,425,000 for county roads will be voted in October.

**Sacramento, Cal.**—Detailed descriptions of highways and bridges to be constructed under proposed \$2,425,000 bond issue are given below. There are 41 routes to be constructed. The descriptions follow: No. 9, North Grant line—Beginning at junction with Jackson Rd. about one-half mile northwest of Slough House, thence running southwest through lots 2, 3, 4, 5, 6 and 7 of the Daylor Estate, thence northwest along the division line between lots 7 and 8 to its intersections with the Sheldon Grant Line Rd., thence southwest along said road to its intersection with the Upper Stockton Rd. in Section 18, Township 6 north, Range 6 east, a distance of approximately 13 miles. 12-ft. highway—This road to be 12 ft. wide, to be built of macadam, cost of same to be approximately \$7,000 per mile. There will be one reinforced concrete bridge on this road, to cost approximately \$600. No. 10—winding way—Beginning at intersection of Grand Ave. and Howard St., Fair Oaks City, thence along Howard St. to the northwest corner of block 13, thence along north side of blocks 13 and 15, and west side of block 5 and north side of blocks 5 and 6 to intersection with a road known as Winding Way, extending easterly to the section line on east side of Sections 5 and 8, thence north along said section line to its intersection with Greenback Rd., a distance of approximately 5.21 miles. \$6,550 Per Mile—This road is to be 12 ft. wide, to be built of macadam, cost of same to be approximately \$6,550 per mile. There will be two reinforced concrete bridges on this road, to cost approximately \$900.

**Sacramento, Cal.**—Bids will be advertised for graveling 1.6 mile of road on Grand Island from cannery at Ryde down the river. Bids also will be advertised for construction of a concrete bridge across Alder Creek.

**Sacramento, Cal.**—First work of checking up Sacramento County Highway routes under proposed \$2,425,000 bond issue by consulting engineers, Tibbetts & Haviland, has begun under F. H. Tibbetts. Thirty-seven miles of main or trunk-line highway has been examined, as well as a dozen or so miles of proposed laterals. Here are Delta roads: River Rd., 37.77 miles; Riverside, 3.38; North Grand Island, 11.90; East Grand Island, 16.90; Ryde-Howard, 2.34; Sutter Island, 6.02; Brannan Island, 3.38; Twitchell Island, 1.05; Sherman Island, 11.02; Jackson Slough, 1.50; Hood-Franklyn, 3.83; Walnut Grove-Thornton, 1.26. The main highways will be 14 feet wide, while the laterals will be 12 feet. Every one of 41 roads, aggregating 271 miles, will be investigated by consulting engineers.

**San Francisco, Cal.**—Board of Public Works has initiated public proceedings for paving and improving of Harrison street, between Sixteenth and Twentieth streets.

**San Francisco, Cal.**—Early rebuilding of Sloat boulevard is being urged.

**San Francisco, Cal.**—City Engineer states cost of vitrified paving around Civic Center plaza at \$64,080. Price of California-made brick is \$35 per 1,000, he states, and 747,000 will be needed. The Fay Construction Co. has informed Supervisors that asphalt paving can be laid for half cost of brick. City architects want vitrified brick because its color will harmonize with Civic Center buildings.

**San Francisco, Cal.**—A plan for replatting property in Islais Creek district, so that streets may be opened, has been submitted to Board of Supervisors by E. W. Newell, R. T. Harding and Henry E. Monroe. One purpose of proposed change is to afford route for Municipal Railway from Potrero Ave. to Hunter's Point.

**Yuba City, Cal.**—Slitter county may be bonded in sum of \$550,000 for building of good roads and bridges.

**Bridgeport, Conn.**—Paving of Knowlton St. about 4,000 sq. yds. will be undertaken this season.

**Bristol, Conn.**—City will widen and improve Union St.

**Cocoa, Fla.**—City of Cocoa has made arrangements with engineering firm for survey of all streets, alleys, buildings, etc., within corporate limits, survey being preliminary step to proposed improvement of streets and installation of waterworks and sewerage system.

**Bloomington, Ill.**—Council has voted passage of ordinances for laying of new 5-ft. concrete sidewalks on Kelsey St., from Center to Lee, estimated cost \$699.70; on south side of Division St., between Center and Roosevelt Ave., estimate, \$63.63, and on the east side of Roosevelt Ave., between Kelsey and Division Sts., estimate, \$90.51.

**Canton, Ill.**—Contracts for Canton Township's state aid hard roads will be let in Springfield, Oct. 15 at 11 a. m., according to advices received from State Highway Commission. Commission is in charge of letting bids.

**Chicago, Ill.**—Election on question of issuing \$2,000,000 worth of bonds for improvement of roads has been made a certainty when County Board adopted resolution calling upon County Clerk Sweitzer to place that question on November ballot.

**Ottawa, Ill.**—Estimates for paving East Hill, in South Ottawa, have been approved, and bids are being received.

**Peru, Ill.**—Specifications for improvement of Deer Park road have been received in Peru from Springfield, and with it announcement that excavating work on job must be completed by December 1. There is over 19,000 cu. yds. of dirt to be moved.

**Waukegan, Ill.**—Paving of Washington St. has been ordered.

**Bloomfield, Ind.**—No bids have been received for \$5,000 4½ per cent. Taylor Twp., Greene Co. gravel road bonds, offered for sale by County Treasurer John W. Johnson. An issue of \$5,100 Richland Twp., Greene Co. gravel road bonds sold at par to Bloomfield State Bank.

**Fort Wayne, Ind.**—Rudisill boulevard will be widened and improved from Calhoun to Hanna Sts.

**Fort Wayne, Ind.**—Board of works will have up for confirmation resolution for paving of alley west of Calhoun St., from Wayne St. to alley south; and alley between Calhoun and Harrison Sts., from Washington to Jefferson; the alley between Webster, from Sutfenfield to Woodland.

**Fort Wayne, Ind.**—County Commissioners have been petitioned for new road north of city, petition being signed by Louisa Geiseking and forty-nine others. Road asked for is from junction of Lima Rd. and Suburban Ave. in south half of section 26, north range 31, thence east across right-of-way of Fort Wayne & Northwestern Interurban Co. and Lake Shore & Michigan Southern Co., thence east through Irvington park to Oakwood Ave. Road petitioned for is 50 ft. wide. Viewers will act on petition on Oct. 8.

**Madison, Ind.**—County Treasurer Jeffreys has sold supplementary issue of Smyrna Township bonds for completion of road petitioned for by James M. Sullivan to John B. Lawler for par, accrued interest and \$5.25 premium.

**Muncie, Ind.**—Board of County Commissioners have held joint meeting with commissioners of Henry Co. in connection with construction of road on county line between Perry Twp. in Delaware Co. and Stoney Creek Twp. in Henry Co.

**Rensselaer, Ind.**—Road bonds offered here have not been sold, but contractors have now made arrangements with Fletcher-American National Bank, of Indianapolis, by paying said bank \$175 to take one issue at par. It is likely some arrangement will be made for the others. First issue, \$12,600; second issue, \$11,600.

**Shelbyville, Ind.**—Plans are being made for patching bitulithic streets.

**South Bend, Ind.**—Grading and paving of various streets have been planned.

**Sugar Creek, Ind.**—Road election held in Sugar Creek Township has been carried. The highway to be improved is 3¼ miles long. It connects with Boggs-town pike on east and with gravel road out of Needham, Johnson County, on west, and there will then be pike all the way from this city to Needham.

**Burlington, Ia.**—Construction of a practical road through Henderson Co. bottoms is being discussed.

**Emporia, Kan.**—Resolution has been adopted for grading, draining, curbing, guttering and paving of 5th Ave. R. M. Hamer is Mayor.

**Emporia, Kan.**—Ordinance has been passed, providing for grading, draining, curbing, guttering and paving of Fifth Ave. from west side of Merchant St. to east side of State St.

**Hutchinson, Kan.**—Resolution providing paving of Poplar St. from Ave. A to Sherman has been passed. Paving will be one course of brick on concrete base, and asphaltic filler will be used. Paving will connect pavement on Sherman and Avenue A.

**Leavenworth, Kan.**—Ten instalment ordinances providing for improvements made on following streets have been placed on their second reading and passed: Paving alley between 2d and 3d and Arch and Vine Sts.; alley between 4th and 5th and Miami and Osage Sts.; alley between Cherokee and Delaware and 7th and Broadway; 7th St. between Miami and Shawnee; Oak St. between W. 7th and Broadway.

**Pittsburg, Kan.**—Resolution has been passed calling for paving of alley between Pine and Walnut Sts. from 4th to 5th. An ordinance to pave 20th St. from Broadway to Michigan was read the first time. Commission has passed ordinances for issuance of general improvement bonds in sum of \$26,722.92. These bonds are issued to pay cost of paving of intersections.

**Annapolis, Md.**—Engineer Hayman has been directed to prepare plans and advertise for bids for laying sidewalks along West St. extended. Bids will be opened by Board on Oct. 8.

**Baltimore, Md.**—Ordinance for submitting proposed \$1,500,000 loan for completing third section of Key Highway, widening St. Paul St. and deepening channel, has been introduced and given its first reading under suspension of rules in Second Branch City Council. Ordinance has been approved by Board of Estimate and it will be advanced to its second reading before Second Branch.

**Biloxi, Mass.**—An attempt will be made to dispose of \$3,000 worth of bonds for purpose of constructing Vestry Rd. running northeast from Biloxi through Harrison and Jackson counties.

**Blandford, Mass.**—State Highway Commissioner Frank D. Kemp has estimated that it would cost \$7,200 to complete macadamizing of highway to Woronoc line and three concrete bridges.

**Haverhill, Mass.**—Bonds in sum of \$22,000 will be sold for street improvement work and to complete work on school houses.

**Haverhill, Mass.**—Alderman Wood has presented order to Municipal Council for bond issue of \$22,000, which was laid on table under rules for one week. Issue of



bonds includes \$3,000 for school house construction, \$2,000 for construction of sidewalks and \$17,000 for construction of streets. Work on streets is to include Highland Ave., Maple Ave., and Webster St. extension. An order for macadamizing of Highland Ave. at cost not to exceed \$7,480 has been passed. City Engineer Lawton is in Boston to secure approval of State Highway Commission of proposed work on Highland Ave., Maple Ave. and Webster St. extension.

**Lowell, Mass.**—Commissioner Morse has been authorized to present requisitions with purchasing agent for purchase of 250,000 paving blocks.

**Pittsfield, Mass.**—The Massachusetts Highway Commission has called for bids for building section of state highway about 10,600 ft. in length in town of Becket, bids to be opened at noon, Oct. 6, at commissioner's office in Boston.

**Pittsfield, Mass.**—A new order for \$6,500 for work on New West St. preliminary to paving has been adopted.

**Springfield, Mass.**—City finance committee has awarded new bond issues, totaling \$147,000, to Northampton institution of savings at premium of \$8.30 on \$1,000. The school bonds amount to \$110,000. The Main St. bonds \$25,000, and the Mt. Tom road bonds \$12,000.

**Williamsett, Mass.**—At special meeting of Board of Aldermen three orders passed their second and final readings, authorizing City Treasurer to issue bonds for \$2,640 for sidewalks in city, \$8,300 for Fairview school-house, and \$8,000 for sewers. No action was taken on appropriation for Fairview sewer.

**Flint, Mich.**—City Engineer Schoecraft has presented to Common Council estimates of pavements on portions of 31 streets to be constructed next year. There are two sets of tables. One was requested by Common Council and covers pavements Council has practically decided to build. Other covers pavements, construction of which has been considered. Total cost of proposed pavements is estimated at \$346,000. Their total length is 50,333 ft. or nearly 10 miles. Amount of bonds it would be necessary to issue to cover city's 25 per cent of cost of construction is \$57,000, a large portion of city's share of cost of construction having been authorized in previous bond issues.

**Grand Rapids, Mich.**—Council is to request City Engineer to prepare map for opening of Pearl St., N. W., from Front Ave., its present western extremity, to Scribner Ave., with a view of pushing it eventually as far as Mount Vernon Ave. A petition is prepared for Council to open Terrace Ave., S. E., from Griggs St. to Burton St.

**Grand Rapids, Mich.**—Residents of Paris and Wyoming Twps. have signed petition, to be presented to Kent Co. good roads commission Thursday afternoon, asking that work on one mile of concrete road south of Burton St. be continued.

**Spring Lake, Mich.**—Organizers of Grand Highway Association, to promote good road between Grand Haven and Grand Rapids, are considering ways and means to raise funds of \$30,000 to use for reward money to supplement state reward to induce county road commissioners to put in concrete or some form of hard surface or permanent road construction.

**Wyandotte, Mich.**—Petition signed by residents living on Oak St. between 12th and 13th Sts., protesting against paving of thoroughfare in that block because of lack of sanitary sewers, has been received. As city clerk advertised for bids for paving of Oak St. three weeks ago, it is not likely protest will be allowed.

**Carthage, Mo.**—Ordinance has been adopted providing for installing of curb and gutter on both sides of McGregor St. from Cedar St. to Eldorado St., wherever such curb and gutter is not already installed.

**Chillicothe, Mo.**—Petition has been presented to City Council asking Council to make order instructing city engineer to prepare plans and specifications for paving of E. Polk St. from Elm to Broadway.

**Jefferson City, Mo.**—At November election proposition will be submitted to voters, requiring a bond issue of \$50,000,000 by State for improvement of public highways.

**St. Joseph, Mo.**—Ordinance has been passed providing for grading Penn St. from 28th to 29th Sts.

**St. Joseph, Mo.**—Ordinance has been adopted to provide for paving (with asphaltic concrete) Lovers Lane from Sixth Ave. to Marion St. (to a width of 30 ft. between curbs), and constructing sidewalks, and concrete (artificial stone) combination curb and gutter there along.

**St. Joseph, Mo.**—Taxpayers are asking for new sidewalks on several streets.

**Hastings, Neb.**—Plans and specifications have been completed by County Surveyor Fuller for new concrete sidewalk to be built around county court house.

**Omaha, Neb.**—Hugh Murphy and Chas. Fanning had almost a monopoly in bidding upon city asphalt and brick paving contracts submitted to Council for seven districts. On contract for repaving Farnam St. from 20th to 24th, Murphy bid \$1.80 for the asphalt, \$1.78 for concrete asphalt, and \$1.84 for vitrified brick. On same grades, Fanning bid \$1.83, \$1.73 and \$1.86.

**Keypoint, N. J.**—At regular meeting of Boro Council it was decided that all sidewalks covered by boro ordinance must be laid before cold weather sets in. Council proposes to have all improved walks laid by that time. Clerk Arthur S. Van Buskirk has been authorized to advertise for bids.

**Linden, N. J.**—Two ordinances authorizing construction of sidewalks have been passed on final reading at meeting of borough council.

**Passaic, N. J.**—County Engineer Garwood Ferguson will report to Board of Freeholders on proposition to construct a road and necessary bridges from Hewitt bridge to Greenwood Lake Glens. Estimates of expenses entailed approximate \$70,000. One plan which freeholders have under consideration is construction of road 24 ft. wide, from Hewitt station to the Glens, at cost of about \$50,000.

**Paterson, N. J.**—Ordinance has been passed for sale of bonds for macadamizing streets. J. J. Brophy is clerk.

**Trenton, N. J.**—State Road Commissioner Stevens is considering advisability of devoting attention of his department during coming fall months to work of reconstructing gravel roads which form route to Atlantic City and other seashore points. Two roads that will be improved should proposed plans be adopted will be one from Keypoint through Freehold to Lakewood, and highway that extends from Berlin in Camden County to Atlantic City. County roads that will thus be improved will be those of Middlesex, Ocean, Monmouth, Camden and Burlington.

**Vineland, N. J.**—Borough Commissioners has adopted two resolutions embodying propositions to be placed before the voters at general election for paving of Landis Ave., one presented by Commercial League to bond borough in sum of \$100,000 to pave from eastern to westerly lines and other by Mayor Stevens to pave from Fourth St. to the easterly line and also Sixth St. from Landis to Wood at cost of \$60,000.

**Vineland, N. J.**—Borough Commissioners have voted for second time to ask voters at coming election for bond issue of \$100,000 for paving Landis Ave., main thoroughfare of town.

**Albion, N. Y.**—The Albion Chamber of Commerce has taken up matter of securing state aid for paving of Main St. in this village from Allen Rd. to Gaines-Albion corporation line. It is proposed to pave street with sandstone from local quarries, or brick with concrete foundation, and to use village funds to pave street entire width.

**Binghamton, N. Y.**—Communication will be submitted to Common Council by State Highway Department showing plans for improvement of Conklin Ave. and Chenango St. Plans contemplate construction of brick pavement by the state on Conklin Ave. from Pierce Creek bridge to the city limits.

**Canandaigua, N. Y.**—The raising of \$27,000 through sale of bonds has been ordered to obtain funds to meet county's share of construction of Rushville-Gorham and Gorham-Stanley improved highways.

**Fulton, N. Y.**—With the assistance of the County Board of Supervisors Fulton and Oswego Automobile Clubs have completed preliminary plans for early construction of five-mile link of unfinished state road between Dexterville and Hannibal. Fulton officials believe contract will be let this fall, as there is appropriation of \$2,000,000 available for county highway work. This appropriation comprises two-fifths of total appropriation of \$5,000,000, of which \$3,000,000 is to be used on State roads. Two other roads in county also will be considered in fall contract letting, cost of work coming under \$2,000,000 appropriation.

**Kingston, N. Y.**—Ordinance has been passed for grading, top dressing, curbing, guttering and flagging McEntee St. from Hone St. to Pierpont St.

**Kingston, N. Y.**—State Highway Department intends to build a 16 ft. concrete state road from watering trough on Washington Ave. through Hurley Ave. to city line, and to resurface Hurley road from city line to village of Old Hurley. Surveys will be made this year, but work will not be taken up until next year.

**Lestershire, N. Y.**—State has advertised for bids on construction of brick pavement from end of present pavement at St. Charles St. to Erie Creek bridge.

**Niagara Falls, N. Y.**—State will do considerable highway improvement work in Niagara County next year, including paving of River road between Niagara Falls city line and Erie County line.

**Norwich, N. Y.**—At special meeting of Common Council resolution was adopted to petition State Highway Department to make survey, prepare maps, estimates, etc., for concrete highway connecting West Main St. with Plymouth highway, known as State Highway 112. Route will run from west end of Main St. northerly on Canasawacta to Cortland, from Cortland to Plymouth St., out Plymouth to junction of the macadam road. Distance is about one mile.

**Pulaski, N. Y.**—Town Board of Richland has passed resolution directing bridge crossing stream near pumping station on Richland road be widened, extended and repaired. Change is made necessary to conform with State road being built by Contractor A. J. Rockwood.

**Rome, N. Y.**—Contract for Rome and Verona improved highway, running from State Custodial Asylum, through Verona and on to Oneida, will be let this fall and road will be built early in the spring.

**Schenectady, N. Y.**—Ordinances have been passed for various street improvements.

**Theresa, N. Y.**—Board of Village Trustees have called special election for Tuesday, Oct. 6 to vote on proposition of curbing and paving streets of this village. Work to be done consists of laying bituminous macadam on sides of brick work soon to be done in this village by State Department of Highways.

**Yonkers, N. Y.**—Reports have been received from committee on public works in favor of approving plans of city engineer for extension of Sunnyside Drive from its present southerly end to Valentine Lane, and directing city clerk to advertise notice that Common Council will give public hearing in relation to improvement on Monday, Oct. 26.

**Waterloo, N. Y.**—John N. Carlisle, State Commissioner of Highways, has commenced to advertise for bids for construction of Waterloo village county highway No. 1,211. Highway is 1.41 mile in length and is to be constructed of brick and macadam, village to pay the additional expense. Cost of this highway will come under appropriation of \$5,000,000 which becomes available on Oct. 1.

**Watertown, N. Y.**—Board of Public Works has asked for \$12,000 for paving north side of public square.

**Cincinnati, O.**—Motion for survey to allow extension of Madison Rd. from Woodburn through to Gilbert Ave. has been referred to Committees on Streets and Parks and Appropriations.

**Sandusky, O.**—General paving and sewer bonds in sum of \$41,000 will be sold until noon, Oct. 31, by F. W. Bauer, City Auditor.

**Springfield, O.**—Improvement of streets in extreme southeastern part of city has been petitioned for.

**Urbana, O.**—Ordinances have been adopted for paving of various alleys with concrete.

**Youngstown, O.**—Extension of Mill-cent Ave. is being planned.

**Eugene, Ore.**—One bid for paving Alder St., between Ninth Ave. east and the mill race, has been presented. This was by Clark & Henery Construction Co. and figure was \$2,125.10. Remonstrance against this work has been presented and bid referred to street committee for one week.

**Portland, Ore.**—Halsey St. at intersection of First is to be extended through site of proposed African Zion Methodist Church.

**Portland, Ore.**—Street and sewer improvement bonds in sum of \$300,000 have been sold.

**St. Johns, Ore.**—Council has received petition for improvement of Stanford St., between Buchanan and Burr Sts. by sidewalk, curb and grade, and resolution directing the City Engineer to prepare



plans, specifications and estimate for improvement of same has been adopted. A petition for improvement of Macrum Ave., between city limits and O. W. R. & N. railroad tracks by grade, sidewalk and curb received like treatment.

**Chester, Pa.**—Bids for paving of Crosby St., Thurlow St., 6th St., Ulrich St. and 5th St. have been received by City Council and bids and contracts were given to City Engineer for tabulation. Contracts will be awarded later. The bidders were the Union Paving Co., Barber Asphalt Paving Co. and the Eastern Paving Co. Following were the bids submitted for streets by the various corporations: Crosby St., from 12th to 14th Sts., Barber Asphalt Co., \$2.45; Union Paving Co., \$1.97; Eastern Paving Co., \$2.02; Thurlow St., from Front to 3d Sts., Barber Asphalt Co., \$2.48; Union Paving Co., \$1.85; Eastern Paving Co., \$1.89; 6th St., from Booth St. to Highland Ave., Barber Co., \$2.48; Union Co., \$1.87; Eastern Paving Co., \$1.89; Ulrich St., from 3d to 5th Sts., Barber, \$2.42; Union, \$1.89; Eastern, \$1.97; 5th St., from Penn St. to Edgmont Ave., Barber, \$2.42; Union, \$1.89; Eastern, \$1.97. The Barber Co. bids were for Trinidad Lake sheet asphaltum; the Union Paving Co. provides for fibertine, and the Eastern Paving Co. bids provide for Rocktec, Aztec asphaltum. Lowest bidders according to bids submitted were the Union Paving Co., who were lowest on every street which is to be paved.

**Connellsville, Pa.**—Paving of Isabella road has been authorized by Council.

**Erie, Pa.**—Extension of State St. is being discussed; estimated cost \$50,000.

**Erie, Pa.**—Repaving of 11th St. from Cherry to Liberty Sts. has been authorized by Council.

**Hazleton, Pa.**—Ordinance has been passed providing for bonding of city in sum of \$350,000, of which \$126,400 is for paving various streets and repaving Broad St., and balance for sewer construction.

**New Castle, Pa.**—A petition of Morton St. residents to have thoroughfare graded and paved with brick from East Washington St. to Long Ave. has been referred to Committee of Whole for later consideration.

**Philadelphia, Pa.**—Resolution has been passed advocating purchase by city of property extending 100 ft. north of building line of Locust St. and the widening of that thoroughfare from 8th to 16th Sts.

**Williamsport, Pa.**—It has been decided to repave West 3d St. from Pine to William St.

**Williamsport, Pa.**—Ordinances have been presented providing for paving of State St. from Third to Church Sts., and for resurfacing of West Third St.

**Providence, R. I.**—Resolutions have been passed for paving of certain streets.

**Jellico, Tenn.**—A mass meeting has been held where prominent citizens of Corbin, Williamsburg and Jellico advocated building of \$200,000 worth of good roads through mountains of three counties, to connect with pikes already running through towns and farming sections.

**Knoxville, Tenn.**—The resurfacing of Market Square paving with asphalt is under consideration by members of City Commission.

**Austin, Tex.**—City Council has passed order requiring paving of one block of West 24th St., from Guadalupe to Whitis Ave., and one block of Whitis Ave. from Twenty-fourth St., north, to Twenty-fifth.

**El Paso, Tex.**—Plan is now being worked out by city of El Paso, the Rotary Club and business men to build scenic highway on North Mesa overlooking city and Mexico. This drive has been surveyed to run along rim of Mesa for distance of six miles. It will connect with Mesa Ave. and will extend around base of Mount Franklin.

**Ennis, Tex.**—See "Miscellaneous."

**Galveston, Tex.**—County Treasurer Robertson has announced that he had completed purchase of 25 special road bonds at par and accrued interest, as had been authorized by board several weeks ago. Bonds were of \$1,000 denomination and total cost to county was \$25,569.44, and \$6.85 in exchange.

**Smithville, Tex.**—R. J. Slagle, secretary of Ten Thousand Club, has launched proposition to build 125 miles of good roads connecting this town with Hous. ton.

**Moundsville, W. Va.**—Paving of various streets has been authorized.

**Wheeling, W. Va.**—Appropriation of \$1,000 has been made for improvements on Charles St., \$1,500 for Baltimore St.,

and \$800 for improvements to Eoff St. below 27th St.

**Centralia, Wash.**—The Kelso Town Council has voted to cooperate with Cowlitz County Commissioners in laying first class rock surfacing on route of Pacific highway along First St. in North Kelso. Improvement will take about 400 yds. of rock.

**Tacoma, Wash.**—Council has made plans to grade the alley between Prospect and Fife Sts. from N. 21st to 23d and lay concrete roadway 12 ft. in width.

**Tacoma, Wash.**—Ordinance has been passed creating sidewalk district on R St. from 9th to 11th Sts. Cement sidewalks will be laid. Estimate cost of work, \$931.35.

**Sheboygan, Wis.**—County Board has appropriated \$15,000 for highways.

**Superior, Wis.**—It is estimated that \$55,000 will be required for street repairs.

**Niagara Falls, Ont., Can.**—Next spring will probably see beginning of work on extension of Niagara-Port Erie boulevard from this city to Queenston and Niagara-on-the-Lake. The Queen Victoria Park Commission strongly urges the extension. Estimated cost of work is about \$415,000.

#### CONTRACTS AWARDED.

**Oakland, Cal.**—For improving of Edgerly St. to Hutchinson Co., Oakland, Cal., at following bid: Grading street, including sidewalk (cutting), 38 cts. per cu. yd.; oil-macadamizing, 10½ cts. per sq. ft.; curbing with redwood 3x12 in., 11 cts. per lin. ft.; gutters of concrete, 14 cts. per sq. ft.

**Pasadena, Cal.**—To J. E. Haddock, of Pasadena, contract for work on N. Madison Ave., his bid totaling \$1,920.48. Thomas C. Breitenstein, Pasadena, was awarded contract for work on Woodbury Road, including storm drain, at \$6,570.20.

**Daytona, Fla.**—Special meeting of City Council has been held to award contracts for necessary grading and fills, preparatory to construction of new river boulevard, cost of which will be borne by Commodore C. G. Burgoyne. Contract for cement work was awarded the C. K. Barnhart Contracting Co. Contract for the fills has not yet been closed.

**Lewiston, Ida.**—For street improvement in district from 9th St. to 19th inc. to Blackman & Tribou, Walla Walla, for \$20,543.66.

**Chicago, Ill.**—The Illinois State Highway Commission has awarded contracts for construction of cement highway in Will county, this highway being portion of trans-continental Lincoln Highway. The contract calls for road 10,200 ft. in length, 10 ft. wide, with 4-ft. shoulders of macadam on either side. It will be of highest type of concrete construction, 7 in. thick in center and 6 in. at side, making a 1-in. crown. Estimated cost of this road is \$10,700 per mile, including shoulders, sub-grade and all preliminary work.

**Springfield, Ill.**—Contracts for state aid roads have been let by Illinois Highway Commission as follows: Tazewell Co., section D, route 10, concrete, 7,914 ft.—W. D. Alexander Co., Normal, \$7,800. Grundy Co., section C, route 2, concrete, 16,460 ft.—Booth & Gilchrist, Gardner, Ill., \$15,489. La Salle Co., section C, route 11, concrete, 22,110 ft.—W. J. Brennan, La Salle, \$20,721. Rock Island Co., section B, route 3, concrete, 3,079 ft.—McCarthy Improvement Co., Davenport, Ia., \$3,050. Rock Island Co., section A, route 11, concrete, 7,270 ft.—McCarthy Improvement Co., Davenport, Ia., \$7,250. Schuyler Co., section A, route 5, concrete, 6,765 ft.—J. E. Ball & Co., Genoa, Ill., \$6,766. Fayette Co., section A, route 6, concrete, 11,410 ft.—P. M. Johnstone & Co., St. Elmo, Ill., \$9,995. Whiteside Co., section A, route 6, concrete, 7,475 ft.—Shugart & Munson, Nevada, Mo., \$7,249.

**Waukegan, Ill.**—Lowest bidder for construction of cement sidewalks on Home Ave. is Michael McCugo, at 59c. per ft.

**Council Bluffs, Ia.**—By City Council, contract for ten sections, approximately \$2,000 each, of sidewalk in various parts of city. Peter Nelson, of Council Bluffs, bidding 11 cts. per sq. ft. for walks and 30 cts. per cu. yd. for all dirt work, grade or fill, was awarded sections 1 and 9. E. A. Wickham & Co., Council Bluffs, bidding 11½ cts. per ft. for walk and 30 cts. a yd. for dirt moving, was awarded remainder of work. These were the only bids.

**Muscantine, Ia.**—By County Board of Supervisors for construction of ½ mile concrete highway in Moscow to Elmer Gochanour.

**Emporia, Kan.**—J. R. Ramsey, Lawrence, Kan., has been awarded three blocks of paving on Fifth Ave. by City Commission.

**Leavenworth, Kan.**—The E. W. Geiger Construction Co., U. S. Bank Bldg., Salem, Ore., has been awarded contract for paving 6th St. from Chocaw to Oak St. by city commissioners. The Geiger Co.'s bid was \$1.56 for paving, one cent less than estimate made by City Engineer Perkins.

**Pittsburg, Kan.**—Contracts for grading, paving and curbing of Quincy and 16th Sts. have been awarded. Thogmartin & Gardiner, Fort Scott, Kan., are to do grading and curbing. S. A. Clements was awarded contract for concrete base and the paving.

**Annapolis, Md.**—By Board, to Contractor Frank M. Duvall, St. Margaret, Md., contract for grading 7th Ave., Eastport, at his bid of 30 cts. per cu. ft.

**New Bedford, Mass.**—For paving as follows: For block paving, to Simpson Bros., 166 Devonshire St., Boston; endure pavt., to Warren Bros. Co., Boston.

**Springfield, Mass.**—For repairing, paving and resurfacing about 5880 sq. yd. city street to Adams & Ruxton Constr. Co., Springfield, at \$2.47 per sq. yd. for paving and \$1.22 per sq. yd. for resurfacing with Warrenite.

**Detroit, Mich.**—For paving Romeyn St. to Detroit Asphalt Paving Co., at \$8,739; Fort St., from Wilkie to Elmsmere St., to F. Porath & Son, 306 Fr. Pl. Bldg.; Holcomb Ave., from Kerscheval to Mack St., to E. Meredith Co., at \$22,086.

**Wyandotte, Mich.**—By Wyandotte City Commission, contract for paving of Oak St., between the Lake Shore tracks and 13th St., to R. D. Baker, for \$1,306.75.

**St. Joseph, Mo.**—By Board of Public Works for paving with concrete of highway to Standard Construction Co. at \$1.43 per sq. yd., or total of \$20,000.

**Audubon, N. J.**—By Borough officials for concrete paving, including gutters, curbs and walks, on all local thoroughfares still unimproved, to LeCato Construction Co., at about \$70,000.

**Cape May, N. J.**—To J. McLinde, Angelsea, N. J., at about \$13,000 for road work.

**Clayton, N. J.**—For 3,659 sq. ft. of cement sidewalks to Clarence Pomelear at 7½ cts. per sq. ft.

**Elizabeth, N. J.**—Favorable report upon awarding \$100,000 worth of street resurfacing contracts to M. J. Leahy, of New York, has been ordered at conference of finance and street committees.

**Paterson, N. J.**—Hospital Committee of Board of Health contract for new sidewalk in rear of Isolation Hospital pavilions to Jerry Cooper, whose bid was \$218.22.

**Perth Amboy, N. J.**—Contract will probably be awarded to Liddle & Pfeiffer for paving of New Brunswick Ave.

**Endicott, N. Y.**—By Village Board of Trustees contract of paving Washington Ave. with brick to Contractors Tyne & Willey, of Binghamton. Work is to be done in the early spring.

**Rochester, N. Y.**—By Board of Contract and Supply to Rochester Vulcanite Co. contract for asphalt pavement in South St. for \$16,187. Board awarded contract for sewer in Norton St. to F. V. Brotsch Co. for \$697.50. John J. Reed was awarded contract for cement walks in Plymouth Ave. for \$248.75.

**Rome, N. Y.**—For paving with bitulithic Bouck St. from E. Dominick to E. Whitesboro St. to Warren Bros. Paving Co. at \$7,781.20, subject to approval of Common Council.

**Schenectady, N. Y.**—Following grading contracts have been awarded: Yale St., J. L. Goeway, \$326; Princeton St., Shear & Wilson, \$1,185; Harvard St., J. L. Goeway, \$161; Vassar St., W. D. Goodale, \$115; Brown St., J. L. Goeway, \$100; Colgate St., Shear & Wilson, \$238; School St., J. L. Goeway, \$800; Cornell St., W. D. Goodale, \$545; Aberdeen St., Shear & Wilson, \$399.50.

**Columbus, O.**—Road contracts aggregating nearly a half million dollars have been let by State Highway Commissioner Marker. He received bids on fifteen new construction jobs in twenty counties and two repair jobs in two counties. Among contracts awarded in this action of state are two in Madison coun-

ty, including 6.1 miles macadam on the Washington-London Road to J. M. Snouffer, Columbus, \$57,000, and the Marysville-London Road, 6.75 miles macadam, to J. M. Snouffer, \$47,400.

**Crooksville, O.**—For paving North Buckeye and China St. with brick to Bock & Son, Coshocton.

**Massillon, O.**—For paving of post office alleys with concrete to Phillip Diefenbacher & Sons, of this city, by Board of Control at bid of \$1,017.60.

**Carlton, Ore.**—To Hayden Bros. & Bidwell, Spalding bldg., Portland, for street improvements, consisting of 7,563 yds. conc. pavement, 3,935 cu. yds. excavation, 1,060 lin. ft. conc. curb and \$780 in miscellaneous items. Jones & Flag, McMinnville, are engrs.

**Portland, Ore.**—Contracts for various street improvements have been awarded as follows: For paving of E. 25th from Holgate to Gladstone to Oskar Huber, Electric bldg., at \$5,228 for asphaltic conc. For paving of Blandena Ave. from Williams to Vancouver Ave. to Oskar Huber at \$1,395 for asphaltic conc. For conc. walks, curbs, etc., on 61st St. S. E. from S. line of P. R. L. & P. right of way to E. 45th Ave. S. E. to Miller & Bauer, Portland, for \$10,320. For paving of E. 43d from Hawthorne to Main to O. Huber for \$1,958 for conc. For paving of E. 30th St. from Alberta to Ainsworth to O. Huber for \$17,548 for asphaltic conc. Andrew & Harrar at \$1,641 was low bidder for grading, sidewalks, curbs, etc., on 66th St. S. E. from 63d Ave. to 65th Ave. S. E. Gebisch & Joplin, Rothschild bldg., at \$972, was low bidder for grading, sidewalks, curbs, etc., on Beacon St. from E. 8th to E. 7th Sts. O. Paulson, 320 Omaha Ave., at \$1,273, was low bidder for grading, curbs and sidewalks on Delaware Ave. from Portland blvd. to Dekum Ave., and at \$528 for Going St. from Irwin to Patton Ave.

**Erie, Pa.**—Contract has been awarded to Mayer Brothers, Erie, Pa., for paving 9th St. from State to German Sts. The bid was for \$9,981.50.

**Meadville, Pa.**—By City Council for paving of South Cottage St. to Vetter Construction Co., Meadville, at \$2,172.

**Pittsburgh, Pa.**—The Monongahela Construction Co. has been awarded contract for construction of roadway from Washington boulevard to new Tuberculosis Hospital on Leech farm. The bid was \$19,195.

**Pittsburgh, Pa.**—For improving Ingot and Perryville Road to D. W. Chellis & Sons, Sewickley, at \$60,539.

**Seranton, Pa.**—To Standard Bitulithic Co., 50 Church St., New York City, at \$2.39 a sq. yd., for paving and curbing Monroe Ave., Vine Ave., and Quincy Ave., with bitulithic.

**Sioux Falls, S. D.**—For construction of cement concrete sidewalks on various streets to Odney Bros. & Stadium, at 12½ cents per sq. ft. for sidewalk, and grading at 35 cents per cu. yd.

**Galveston, Tex.**—Commissioner Deats has recommended awarding of contract for shelling Texas City cutoff road to Hansons Sons, Galveston, at their bid of \$1.23 per cu. yd.

**Richmond, Va.**—By Administrative Board for street improvement work: Granite curbing, to Albin Netherwood at 65 cts. a lin. ft.; corner curb, \$6.50. Granite gutter paving, to C. M. Weinbrun at \$1.15 and \$1.10. Vitrified brick paving, to C. M. Weinbrun at \$2.80 a sq. yd. Brick sidewalk paving to A. W. Maynard at 64 cts. a sq. yd. Grading and graveling to A. L. Phillips' Sons at 22 cts. a cu. yd. and 30 cts. a cu. yd., respectively.

**Richmond, Va.**—Following bids were received Sept. 17 for about 119,352 sq. yds. smooth paving. Work was let in sections, hence variation in price of some bidders. Central Construction & Supply Co., Harrisburg, Pa., \$1.53 per sq. yd. (plus royalty) for bitulithic, 2-in. surface, 5-in. concrete base, and \$1.41 per sq. yd. for Bermudez, 2-in. surface, 5-in. concrete base. Atlantic Bitulithic Co., Richmond, Va., \$2 per sq. yd. for bitulithic and \$1.29 for Aztec asphalt, and \$1.39 for Bermudez. Hassam Paving Co., 311 Main St., Worcester, Mass., \$1.41 and \$1.50 for Aztec asphalt. Cont. Public Works Co., 2 Rector St., New York, \$1.38, \$1.40 and \$1.54 per sq. yd. for Aztec asphalt. H. H. George, Jr., & A. L. P. Sons, \$1.49 and \$1.54 per sq. yd. Aztec asphalt. Louis Lawson, Norfolk, Va., \$1.31 per sq. yd. Aztec asphalt. H. L. Matthews, \$1.51, Aztec, and \$1.65 for Bermudez. E. J. McGuire, Norfolk, Va., \$1.49, \$1.54 and \$1.59 for Aztec, and \$1.64, \$1.69 and \$1.74 for Bermudez. F. H. Hudson, \$1.34 and \$1.36, \$1.42 and \$1.46 for Aztec. Union Paving Co., 30th and Locust Sts., Philadelphia, Pa., \$1.51,

\$1.52, \$1.55 and \$1.66 for Aztec. Washington Asp. Block & Tile Co., Washington, D. C., \$2.38 per sq. yd. for asphalt block on rolled gravel base block 12 in. x 5 in. x 4, and \$2.38 for asphalt block on 6-in. concrete base. Contract was awarded for 19,313 sq. yds. of asphalt and block paving at \$2.38 per sq. yd. to Washington Asphalt Block & Tile Co., Washington, D. C., and contract for 100,039 sq. yds. asphaltic concrete paving at \$1.41 per sq. yd. to Central Construction & Sup. Co., Harrisburg, Pa. All contracts for asphaltic concrete paving required furnishing of Bermudez asphalt. City furnishes all cement for sub-base in original construction. Chas. E. Bolling is City Engineer.

**Goldendale, Wash.**—For changing and grading permanent highway No. 4, Maryhill Mountain Division to J. H. Sellers, at \$12,280.

**Port Angeles, Wash.**—For grading and constructing pile trestle on Lincoln St. to Anderson & Co., Victoria, B. C., at \$19,963.

**Seattle, Wash.**—By Board of Public Works contract for paving 47th Ave. Northwest to J. J. Maney, at \$20,445; sandstone paving on West Less St. to John G. Pierce, at \$3,582, and for plank-ing 26th Ave. Southwest to Swan & Bjork, at \$8,356.

**Seattle, Wash.**—By Board of Public Works, for paving of W. Mercer St., to A. J. Baumgartner, Seattle, at \$9,293.75.

## SEWERAGE

**Birmingham, Ala.**—Bids for construction of sewerage disposal plant at Bessemer have been opened by Board of Revenue. Estimated cost of work is about \$85,000 and is unit of plant designed by board to cost over \$150,000.

**Orland, Cal.**—The \$15,000 bond issue for the extension of Orland's sewer and water system has been sold to State Industrial Accident Insurance Commission.

**Willows, Cal.**—Petitions are being circulated in Willows asking for formation of three new sewer districts. The three jobs, which will be done under the Vrooman Act, will cost approximately \$25,000.

**Cocoa, Fla.**—See "Streets and Roads."

**New Smyrna, Fla.**—Movement is on foot to bond city for system of water-works and sewers.

**Lafayette, Ga.**—Election will be held Nov. 16 for voting on bonds for sewers.

**Fort Wayne, Ind.**—Bids will be asked for installing of set of lift pumps in Lakeside to relieve sewers. Board has adopted resolutions for sewer for new additions in southeastern portion of city.

**South Bend, Ind.**—Construction of vitrified pipe sewers on various streets has been planned.

**Muscatine, Ia.**—Resolution has been adopted ordering construction of sanitary sewer in Sub-Sewerage District No. 27 of Main Sewerage District No. 1; combination storm-water and sanitary sewer in Sub-Sewerage District No. 28 of Main Sewerage District No. 1; a storm-water sewer in Sub-Sewerage District No. 29 of Main Sewerage District No. 1, and sanitary sewer in Sub-Sewerage District No. 30 of Main Sewerage District No. 1. H. B. Caple is City Recorder.

**Fort Scott, Kan.**—Board of Commissioners of City of Fort Scott, Kan., invites bids on issue of public utility bonds in sum of from \$20,000 to \$25,000, issued to pay for construction of sewage disposal plant.

**Hutchinson, Kan.**—Plans are being prepared for construction of intercepting sewer to connect all submains and laterals. Bids will shortly be received.

**Lexington, Ky.**—City Engineer has been directed to construct at once storm water sewer and catch basin on Manchester St. at foot of the Manchester approach to Jefferson bridge.

**Saginaw, Mich.**—Commissioner Johnson has introduced two appropriation ordinances naming \$5,000 for east and like amount for west side sewer funds to complete work along this line that has been started.

**Duluth, Minn.**—Construction of sanitary sewer in Crescent View addition, between 35th and 36th Aves. E. and Superior and 4th Sts. has been ordered. Estimated cost is \$5,904.53. Sanitary sewer was ordered in Fifth alley, between 9th and 10th Aves. W. Estimated cost is \$440.83.

**Duluth, Minn.**—Petition has been received for sanitary sewer from 60th Ave. E. to 58th Ave. in Wyoming St. in 58th Ave. to Oakley St., and in Avondale St., between 58th and 54th Aves. An-

other was received for sanitary sewer in 54th Ave. E., from Wyoming to Avondale Sts., and in Avondale St. to a point 225 ft. westward.

**St. Joseph, Mo.**—Ordinance has been passed to provide for construction of sewers in portion of sewer district No. 57, being in Auguste St., from Main St. to Dewey Ave., in the alley between Main St. and Dewey Ave., from Auguste St. to a point 90 ft. north, and in alley between 2d and 3d Sts., from Franklin St. to point 100 ft. north.

**Camden, N. J.**—Ordinance has been passed authorizing construction of sewers, culverts or drains in and along Stevens St., from 27th St. to 30th St.; Pine St., from Walnut St. east; Fourth St., from Taylor Ave. north; Division St., from Newton Ave. to W. J. & S. S. R. R.; Ninth St., from Chelton Ave. to Bulson St.

**Point Pleasant, N. J.**—Point Pleasant is soon to float bonds for \$10,000 extension to its sewer system. Since original system was laid out there have been few extensions and property development in some parts of town demands immediate extension.

**Rahway, N. J.**—Steps will be taken to stroy the pollution of Rahway River by sewage.

**Gouverneur, N. Y.**—At meeting of Chamber of Commerce question of sewers and new water supply for Gouverneur will be considered.

**Newburgh, N. Y.**—Construction of two new sewers has been authorized, and bids will be advertised. One will be through Carter St. and other in Ann St.

**Niskayuna, N. Y.**—Permit has been granted by State Commissioner of Health to Sewer Commissioners of Sewer District No. 2, town of Niskayuna, to discharge sewage or wastes from that district by proposed effluent sewer system of district into Mohawk River through Schenectady sewer system within town of Niskayuna, subject to certain conditions.

**Cincinnati, O.**—Resolution has been adopted for sewerage of Pennsylvania Ave., from Morse St. to Turpin St.

**Cincinnati, O.**—Resolutions have been adopted for sewerage of various streets.

**Marion, O.**—Resolution to construct sanitary sewer and storm water drain in first alley east of State St. from line in middle of lot No. 1050 to Short St., and then east on Short St. to Park St., is being considered. Also resolution for sanitary sewer and storm water drain in Park St. from Patten St. to the George St. sewer.

**Hamilton, O.**—Sanitary sewer system for Lindenwald is being considered.

**Sandusky, O.**—General sewer and paving bonds in sum of \$41,000 will be sold until noon, Oct. 31, by F. W. Bauer, City Auditor.

**Tiffin, O.**—Council will discuss with citizens advisability of placing sewer conduits in river walls.

**Eugene, Ore.**—Ordinance adopting plans and specifications for sewer in alley between 10th and 11th Aves. extending from Almaden St. to Polk St., has been passed.

**Portland, Ore.**—Sewer and street improvement bonds in sum of \$300,000 have been sold.

**Erie, Pa.**—Ordinance has been passed providing for construction of nine (9) inch diameter lateral tile sanitary sewer in Railroad St., in City of Erie, Pa., extending from Twenty-third St. S. E., 800 feet more or less, together with necessary house connections.

**Erie, Pa.**—Ordinances have been adopted for construction of sewers in various streets. M. J. Henry is Clerk City Council.

**Harrisburg, Pa.**—Bids have been opened for three new sewer sections and will be presented to Council. Bids for Maclay St. section are: Central Construction and Supply Co., \$290; William H. Opperman, \$307; G. W. Ensign, \$400. For the 17th St. section, the bids are: William H. Opperman, \$887, and G. W. Ensign, \$872. For a section in River and in Shamokin St., W. H. Opperman, \$947, and G. W. Ensign, \$997.06.

**Hazleton, Pa.**—Ordinance has been passed providing for bonding of city in sum of \$350,000, of which \$223,600 is for construction of sewers and balance for paving purposes.

**Philadelphia, Pa.**—Sewer will be constructed in Indiana Ave., from Fourth to 12th St., at cost of \$200,000.

**Philadelphia, Pa.**—New sewer work will be submitted to contractors for estimates within day or two. Proposals will be received for about 80 branch sewers and three main sewers of particular importance. One sewer to be



constructed in Spruce St., west of the Schuylkill River, will provide new drainage facilities for the University of Pennsylvania and the surrounding section. The Haverford Ave. sewer through the Mantua yards of the Pennsylvania Railroad will be rebuilt, to afford better facilities, which have been needed for the section beyond the yards. The two will cost upward of \$100,000, although about \$70,000 will only be expended on the two at the present time.

**Reading, Pa.**—City Council has approved of bond issue of \$50,000 for construction of sewerage filter.

**Williamsport, Pa.**—Sewer will be constructed in Franklin St. at cost of \$1,500.

**York, Pa.**—Five acres of land in Smell's Meadow may be purchased for utilization in construction of sanitary outfall sewer, and finally to be converted into wide boulevard.

**Dallas, Tex.**—Ordinance providing for issuance and sale of \$50,000 of sanitary sewer bonds authorized by voters of Dallas at municipal election held April 7 last has been passed finally by Board of City Commissioners.

**El Paso, Tex.**—City of El Paso has purchased 72 acres of land adjoining 24 acres already acquired in Martinez addition in East El Paso, for purpose of establishing filtration sewerage system.

**Ennis, Tex.**—See "Miscellaneous."

**Galveston, Tex.**—Following bids have been received for construction of concrete drains on 37th and 41st Sts. No bids were offered for creosoted wood drains. They were referred to Commissioner Sappington for tabulation and report: Freund and Quay, 2,154 ft., \$8.10 per lin. ft.; 510 ft., \$9.90 per ft.; 20 catch-basins, \$30 each; 8 manholes, \$20 each. This made their total bid for the 37th St. drain \$23,255.40. On the 41st St. drain their bid totaled \$13,761. This was for 1,445 lin. ft. of one class, 135 ft. of another, 20 catch-basins and 6 manholes. The prices being the same as for the 37th St. drain. Hunter & Hunter bid on the 41st St. drain. Their bids were, 1,445 ft. concrete drain, \$10.75 per ft.; 135 ft. at \$12.50 per ft.; 20 catch-basins at \$50 each, and 6 manholes at \$30 each. This bid amounted to more than \$15,000.

**Tacoma, Wash.**—Resolutions introduced by Owen Woods have passed Council, declaring Council's intention of creating improvement districts. A storm sewer is planned to be laid on South 42d St. from O St. to Asotin; on Asotin from 43d to 45th Sts. and on 45th from O St. to the outlet on Hosmer. Branch sewers are also included in this district.

**Racine, Wis.**—Sewer bonds in sum of \$75,000 will be sold for beginning of work on trunk sewers.

**Windsor, Ont., Can.**—A large treatment plant connected to five border municipalities on Canadian side by trunk sewer has been suggested as most economical and efficient system of caring for cities' refuse by Dr. H. R. Casgrain to international waterways commission that met in Windsor. City Engineer Brain, of Windsor, advised that city retain its present sewer system to care for drainage water and construct new one for other sewage. This would eliminate cost of treating storm water which does not pollute river to any extent.

#### CONTRACTS AWARDED.

**San Francisco, Cal.**—By Board contract to Daniel L. Bionfield & Co. for sewer work on Jefferson St., between Leavenworth and Hyde Sts., for \$904.75.

**Dade City, Fla.**—To J. B. McCrary Co., Atlanta, Ga., for constructing water-works to cost \$6,000 and sewer system to cost \$19,000.

**Fairfield, Ill.**—To Riley Construction Co., St. Louis, Mo., at \$29,348 for construction of sanitary sewer system. Fuller-Coult Co. are Engineers, St. Louis.

**Waterloo, Ia.**—For repairing damaged sewer on 18th St. W. to A. C. Comstock, of Cedar Rapids, at \$2,160.

**Lexington, Ky.**—To Carey-Reed Co., Lexington, for construction of sanitary sewer on Jefferson St., at following bid: 8-in. pipe, 65 cts. per lin. ft.; 5-in. pipe, 45 cts. per lin. ft.; 5-in. Y branches on 8-in. pipe, 50 cts. each; manholes, \$30 each; flush tanks, \$60 each; repaving asphalt, \$3 per sq. yd.

**Havelock, Neb.**—For constructing sewers to Wilson Reinforced Concrete Co., Wahoo, at approximately \$6,000.

**Bayonne, N. J.**—Contractor Clement Cogan has been awarded contract for reconstruction of Ave. F. sewer by Council.

**Newark, N. J.**—By Board of Works for constructing northwesterly section of Vailsburg sewer to Michael Stefanelli at \$18,167.

**Lestershire, N. Y.**—By Board of Trustees, for construction of sewer on Hudson St., St. Charles St. and Ave. A, Laurel St. and Lester Ave., to George Serafino, Binghamton, N. Y. His bid on Hudson St. sewer was \$789.16, on the St. Charles St. sewer, \$1,112.39, and on the Ave. A, Lester Ave. and Laurel St. sewer, \$2,422.39.

**New Hartford, N. Y.**—Pate & Palmieri, of Utica, have been awarded contract for furnishing and laying 700 ft. of 18-in. vitrified storm sewer in Pearl St., New Hartford, having the lowest bid. Engineer A. M. Scripture was in charge of specifications. Pate & Palmieri bid \$636.48.

**Patchogue, N. Y.**—For constructing storm-water sewer to George Marshall & Son, Jamaica, at \$5,764.

**Utica, N. Y.**—Proposals for construction of storm water sewers in city, Walnut and Knox Sts. and West Ave., have been received from seven contractors. They were: John R. Baxter, Jr., \$2,281.50; P. M. Johnston, \$2,430.87; Pepe & Palmieri, \$2,363.90; Martin McManus, \$2,474.56; A. W. Fitch, \$2,289.55; Frank Caffarelli, \$2,317.38, and Domenick Pirritano, \$2,277.43. After canvassing the proposals City Engineer Kemper reported that Domenick Pirritano was low bidder.

**Cincinnati, O.**—Contract for part of Duck Creek intercepting sewer, from Evanston to Dana Ave., has been let by Service Director Fosdick to D. P. Foley, at his bid of \$25,335.30, which is about \$10,000 below estimate submitted by engineer.

**Massillon, O.**—Contracts for building sanitary sewers in McLain, Madison and Wachester Sts. have been awarded to Joe Perry, of Canton, at \$1,479.65.

**Youngstown, O.**—To Charles Harris contract to build Steelton District sewer No. 1 at cost of \$47,260. The Mahoning Ave. district sewer has been awarded to Andy Trupo for \$32,995, and A. O'Horo will build Steelton sewer No. 2 for \$14,437. No. 3 district sewer has been let to Ed Conricote at \$11,010, also Berlin St. sewer, to cost \$1,633.

**Astoria, Ore.**—To K. Sausett, Bellingham, for constructing sewers in Reclaimed District No. 1, at \$35,189.

**Eugene, Ore.**—To C. H. Mahaney at \$11,623.46 for construction of storm sewer in Fairmount.

**Altoona, Pa.**—For constructing sanitary sewer system in 11th Ward to Loomis & King, Altoona, at \$16,343.

**Archbald, Pa.**—For constructing sewer in Hill St. to Boland Bros., \$10,450.

**La Crosse, Wis.**—To Olaf Sweimes, of La Crosse, at \$6,953, for construction of 12-in. vitrified sewer on 13th St., Madison to Cass, and 12-in. sewers on 4th and Berlin Sts.

**Sheboygan, Wis.**—For construction of sewer in Union Ave. to D. Van Stelle Co. at following bid: 10-in. pipe, 73 cents per lin. ft.; manholes, \$20.

**Sapperton, B. C.**—Robt. McLean & Co., Pacific Bldg., Vancouver, awarded construction of Columbia St. outfall sewer at about \$75,000.

#### WATER SUPPLY

**Birmingham, Ala.**—A bond issue for construction of municipally owned water plant in Birmingham may be feature of campaign for commissioner which will be terminated next September.

**Orland, Cal.**—The \$15,000 bond issue for extension of water and sewer system has been sold.

**Orland, Cal.**—Trustees have ordered City Engineer to make complete plans and specifications for extension of water and sewer systems. As soon as this is done, bids for construction of same will be advertised for.

**Pasadena, Cal.**—City Commissioners are considering special election for voting \$290,000 in bonds for water works improvements.

**Red Bluff, Cal.**—Petition is being circulated calling for election to bond city in sum of \$85,000 to establish a municipal water system.

**Sacramento, Cal.**—City Commissioners are going to take up with D. W. Carmichael, president of Chamber of Commerce, matter of purchase of \$5,268.67 worth of city water main extension bonds. Some time ago Carmichael

agreed to take this amount of bonds to cover the cost of water mains extended into Casa Loma Terrace subdivision north of McKinley Park.

**San Francisco, Cal.**—By vote of 13 to 5 Supervisors have decided to submit proposal to buy Spring Valley Water Co.'s properties at \$3,500,000 to vote of the people.

**Bristol, Conn.**—Additional fire hydrants will be installed.

**Stamford, Conn.**—It has been voted to authorize Mayor to call special meeting of Board of Appropriation and Apportion to take action on proposed appropriation of \$4,000 for new force drain in connection with South End pumping station.

**Cocoa, Fla.**—See "Streets and Roads."

**New Smyrna, Fla.**—See "Sewerage."

**East Peoria, Ill.**—Village is having plans made for water works system.

**Waukegan, Ill.**—It is said that new boilers will be purchased for City Waterworks.

**Fort Wayne, Ind.**—Board of Works wants to have pumps installed in Lakeside before fall and to that end will advertise for new bids on this proposition as soon as legal preliminaries can be gotten out of the way.

**Ankeny, Ia.**—Bond issue in sum of \$12,000 for water works system will be sold Oct. 12. Address J. C. Marts, Mayor.

**Keokuk, Ia.**—Extension of water mains from present terminus at intersection of 14th and Ridge Sts., southerly in 14th St. to Charles St. has been ordered by City Council in resolution.

**Fort Scott, Kan.**—Light and Water Commissioner Freeman Martin has been directed to go ahead with plans for mechanical filtering plant at once, so they may be finished by January election.

**Newton, Kan.**—New 48-in. well will be made at city water works pumping plant at Mission.

**Plaquemine, La.**—Bids will shortly be received for \$42,000 in bonds, proceeds of which will be used for installation of water system. C. A. Rees is City Engineer.

**Atlantic City, N. J.**—City has sold its \$50,000 4½ per cent water bonds to A. B. Leach & Co., 149 Broadway, New York, at par and accrued interest.

**New Brunswick, N. J.**—Construction of \$500,000 water works plant near Landing Bridge is advocated by Robert L. Thomas, engineer.

**Neptune, N. J.**—Water connections will be made by the Monmouth County Water Co.

**Newark, N. J.**—Runyon & Carey, engineers, will prepare plans and specifications for installation of complete water system at Overbrook Hospital.

**Gouverneur, N. Y.**—New water supply is being considered.

**Camden, O.**—See "Lighting and Power."

**Dayton, O.**—It appears probable that city will construct its own water pipes across Miami River near Dayton View bridge and also near Fifth St. bridge for purpose of replenishing water supply to Dayton View and West Side, respectively.

**Lima, O.**—To avert impending water famine the Chamber of Commerce will ask City Council to authorize issue of \$25,000 of emergency bonds. Trustees passed resolution urging Service Director Askins to issue at once order that all water consumers in Lima shall immediately instal meters or be cut from supply.

**Russell, O.**—Bonds have been voted by citizens, proceeds to be used for construction of municipal water system.

**Springfield, O.**—Ordinance is being considered authorizing expenditure of \$15,000 for water works department for boilers and other improvements at pumping station.

**Youngstown, O.**—City Board of Control has taken action to amend contract for turbine pumps for new pumping station, now under construction. As result of this action three Worthington pumps will be installed instead of three Wilson-Snyder pumps, at additional cost of \$1,679 to amount of \$39,975 named in original contract.

**Kiefer, Okla.**—Water works bond issue of \$35,000 will be sold Oct. 17. Address Town Clerk.

**Dubois, Pa.**—Ordinance has been adopted requiring all consumers outside borough limits to install meters.

**Reading, Pa.**—Election will be held in November for voting on proposition of issuing \$450,000, proceeds of which to be used for construction of new reservoir.



**Sioux Falls, S. D.**—Plan to issue bonds for \$135,000 for water works improvements has been approved.

**Sioux Falls, S. D.**—Formal action has been taken by City Commissioners providing for special election on October 20 for purpose of voting on question of issuing \$135,000 in bonds to extend City Waterworks system.

**Denison, Tex.**—Following City Engineer Clenny's report on plans and specifications and cost of equipment for water purifying system, as submitted by various firms who had filed bids on plan, Council has accepted bid of American Water Softening Co., of \$15,034. This does not include cost of certain concrete construction which will be installed by city. Portion of proposed filtering plant which will be built by city will run total cost to between \$27,000 and \$28,000.

**El Paso, Tex.**—City has bought 72 acres of land in eastern part of city on which it intends to build filter system for city sewage which is now emptied into Rio Grande.

**Ennis, Tex.**—See "Miscellaneous."

**Galveston, Tex.**—Following bids for 150 tons cast iron pipe have been received and referred to Commissioner Shay for tabulation and report: United States Cast Iron Pipe & Foundry Co., \$22.75 per ton; R. D. Wood & Co., \$22.75 per ton; Hardy Greenwood, \$22.25 per ton; American Cast Iron Pipe & Foundry Co., \$23.15 per ton.

**Bloomington, Wis.**—Citizens have voted to issue bonds for installation of water system.

**Powell, Wyo.**—Bonds have been voted for installation of up-to-date water works system.

**Niagara Falls, Ont., Can.**—Stamford Council has instructed Frontier Construction Co. to start work immediately on water works pipe line from wells to standpipe in Lundy's Lane. Bids will soon be asked on construction of pump house on Anderson farm. J. K. Henderson has been appointed inspector on job of laying water mains.

#### CONTRACTS AWARDED.

**Alton, Ill.**—By Alton Water Co. to Public Service Co. of Omaha, contract for extending water mains to site of new insane hospital.

**Shelly, Ia.**—For construction of steel water tank and tower to James J. Burke & Co., Salt Lake City.

**Fairmount, Ind.**—Council has given O. M. Drischell, of the Marion Light & Heating Co., contract to complete compressed air plant at water works, for sum of \$187.30.

**Wellington, Kan.**—For furnishing and laying 20,000 ft. of 16-in. Matheson joint steel pipe and 40,000 ft. of 18-in. pipe to N. S. Sherman Machine & Iron Works, Oklahoma City, Oklahoma, at \$120,000. Contract for a 500,000-gal. tank to Chicago Bridge & Iron Works, at \$17,690.

**Clinton, Mass.**—By Waters Comrs., for building dam at Heywood basin to R. H. Newell and N. S. Brock, Uxbridge, at \$17,122. Dam will be 200 ft. long with concrete core wall.

**Groveland, Mass.**—Contract for building of new water works in town of Groveland has been signed between the Hanscom Construction Co., 7 Kilby St., Boston, and Board of Water Commissioners, work to begin immediately. The Hanscom Construction Co. has agreed to take \$50,000 worth of Groveland water bonds at par and will be paid \$40,839.10 for work of installing water system, according to terms of contract. Contract calls for installation of complete water system, town to pay for meters and service connections which, it is estimated, will cost about \$6,000.

**Lowell, Mass.**—For construction filtration plant to Chas. R. Dow, Boston, at \$91,314. Other bidders: Connors Bros., \$113,947; Bruneau-Pettit Co., \$120,000; Wm. Pike, \$150,805, and Danl. H. Walker, \$102,222.

**Columbia Height, Minn.**—To W. D. Lovell & Co., 1415 S. E. Eighth St., Minneapolis, at \$5,325 for extension of water works, furnishing all tools, labor and material.

**Duluth, Minn.**—To Norquist & Berg, contract for laying water and gas mains in Dodge St., from Superior St. to 49th Ave. E., on their bid of \$2,238.50. Hiner was awarded contract for extending water and gas mains in Hawthorne Rd. to 4th St. on his bid of \$1,397.96.

**St. Paul, Minn.**—By Council contract for St. Anthony Park North pumping station to Cameron & Co., at \$2,585.

**Hardin, Mont.**—For installation of proposed water works system to Security Bridge Co., Minneapolis, for \$24,333.33.

**Melstone, Mont.**—For installing municipal water system to Nowell-Atherly Co., Billings, Mont.

**Hastings, Neb.**—To Rutherford Bros., for water extension in Dist. No. 8, at \$1,429.

**Atlantic City, N. J.**—Edward L. Bader, local contractor, was awarded contract for improvements to reservoir at lower end of Doughty's Pond. Mr. Bader's bid for work was \$71,891.25. This bid is \$11,000 less than lowest of bids received two weeks ago, and all of which were thrown out by Mr. Bacharach because of irregularities. It is planned by Mr. Bacharach, who is at the head of the Water Department, to increase capacity of reservoir, and to erect concrete retaining cistern along modern lines. Bids received and their amounts are as follows: Fille-Brown Taylor Co., \$84,067.30; Norton & Gorman Co., \$84,793.50; Atlantic Construction & Supply Co., \$96,288; Kelley-McFeeley Co., \$85,536.57; Merrill-Ruckgaber Co., \$80,369; N. H. Arthur, \$75,585.18; F. N. Boas, \$86,615; Sutton & Corson, \$91,341.65; Chas. F. Eastburn Co., \$77,223.37; Whiting Turner Construction Co., \$97,888.50, and Edward L. Bader, \$71,891.25. Superintendent Van Gilder and Chief Engineer Ferrebee recommended that contract be awarded to Bader. This resolution will lay over for two weeks.

**Liberty, N. Y.**—For constructing a 500,000-gal. reservoir by Board of Water Commissioners to George Mesler, Liberty, at \$5,000.

**Doylestown, Pa.**—Contract for laying water mains on Hamilton, Spruce and North Sts., Doylestown, has been awarded to Clarence Barrett by Town Council for \$845, and contract for main on Logan St., to Clark & Stultz for \$200.

**El Paso, Tex.**—City Council has awarded Fulton Iron Works, of St. Louis, contract to install additional machinery at city water plant, accepting second bid filed by this company. This firm will furnish an oil engine, a pump and an air compressor. Contract price for furnishing equipment and installing it was \$44,700. New equipment will increase capacity of plant 2,000,000 gals. a day, giving it a total capacity of 8,000,000 gals.

**Ogden, Utah.**—City Commission has accepted bid of Brown & Elkins for drilling of ten artesian wells and authorized mayor and city recorder to execute contract with successful bidder. It is planned to increase city's source of water supply by water from wells.

**Seattle, Wash.**—For construction of bulkhead for East waterway to P. Manson at \$22,293.10.

**Winnipeg, Man.**—By Administration Board of Greater Winnipeg Water District contracts for construction of 85 miles of concrete aqueduct in five sections, James H. Tremblay, city, was awarded contract No. 30, known as Prairie section, 20.15 miles in length, at \$945,945. Contract No. 31, the Brokenhead section, 17.75 miles long, went to Thomas Kelly & Sons, city, for \$1,301,485, while contracts Nos. 32, 33 and 34, the Whitemouth section, 18.20 miles, the Birch River section, 16.10 miles, and the Summit section, 13 miles, were awarded to the Northern Construction Co., city, and Carter Halls & Aldinger, city (bidding jointly) for \$1,268,680, \$1,137,010 and \$1,489,520 respectively. District will supply cement, estimated cost of which is \$955,000.

#### LIGHTING AND POWER

**East Sacramento, Cal.**—Nothing now seems to be in way of plan for lighting on Maple Ave. with electroliers, according to Street Department.

**South Pasadena, Cal.**—City Trustees of South Pasadena are considering proposed new lighting system.

**Sullivan, Ill.**—Plans are being made for establishment of municipal electric light plant. Hiram Phillips, Third National Bank Bldg., St. Louis, Mo., is Consulting Engineer.

**Dubuque, Ia.**—Work of installing boulevard lights from Fifth St. south to Second will be commenced as soon as Union Electric Co. can secure the material.

**El Dorado, Kan.**—At special session the El Dorado City Council decided to drill for gas and committee has been appointed to make arrangements for drilling contracts.

**Leavenworth, Kan.**—Plans and specifications for "white way" on Delaware St. have been adopted.

**Leavenworth, Kan.**—City Engineer C. F. Perkins will prepare specifications of standards to be used in construction

of "white way," and distribution of lights.

**Princeton, Ky.**—Question of bond issue of \$15,000, for installation of municipal electric light plant, will be submitted to voters in November.

**Kirkwood, Me.**—Board of Aldermen has approved of improvements to municipal electric light plant, to cost about \$17,000.

**Hagerstown, Md.**—Lighting of streets recently taken in by city is being planned.

**Saginaw, Mich.**—Petitions have been submitted to Council asking that bond issue of \$250,000 for municipal lighting plant be presented to voters.

**Duluth, Minn.**—Council has passed ordinance appropriating \$85,800 for first unit of municipal electric plant.

**St. Paul, Minn.**—Specifications for street lighting for coming year are being prepared by Victor H. Raehrich, director of city testing laboratories. He plans an innovation by asking for bids on nitro-filled incandescent lamps.

**Blair, Neb.**—Bonds for \$35,000 for municipal electric light plan have been carried by a majority of 65 votes.

**Tekamah, Neb.**—Light and Water Commissioner L. D. Wright has made estimates and plans for removal of city's municipal light and water plant. It will also be enlarged and equipped with new machinery. An ordinance authorizing issuance of \$15,000 bonds for improvement will be offered at next meeting of City Council.

**Long Branch, N. J.**—Resolution has been passed, which will be sent to City Commissioners, asking that West End and Elberon sections of city be given better lighting than last winter, and asking that present lights be left on till first of November.

**Irondequoit, N. Y.**—Electric lights may be installed on three main roads.

**Malone, N. Y.**—The Malone Light & Power Co. is planning to install ornamental street lighting system in near future. Company would like to receive designs and estimates of costs.

**Oneida, N. Y.**—Action looking toward improvement of street lighting system is being discussed by Board of Public Works.

**Stony Brook, L. I., N. Y.**—Civic associations of Stony Brook have made application to Brookhaven town board for formation of lighting district, which, it is said, board will promptly grant. Proposed district is one mile square and will provide for 55 incandescent street lamps.

**Fargo, N. D.**—Installation of municipal lighting plant is being discussed.

**Camden, O.**—Citizens of this place will, on Nov. 3, vote on proposed municipal light and water works. Plans and specifications have been completed by Reliance Engineering Co. Plant, if built, will be erected at cost of \$35,000.

**Dayton, O.**—Voters of this city will have privilege of voting on question of municipal ownership of electric light plant at regular election in November.

**Dayton, O.**—Having obtained signatures of 10 per cent. of city's registered voters the Socialist party of Dayton, O., has filed petition with City Commission asking that citizens of Dayton be permitted at general election on Nov. 3, 1914, to vote on question of a \$500,000 bond issue to build and equip complete electric light and power plant and distributing system for Dayton.

**Dayton, O.**—Extension of ornamental lighting system is being considered.

**Marion, O.**—Provisions for lighting Church St. from first alley east of State St. to first alley west of Main St., with 9 5-cluster lights, have been made by City Council. Ordinance for lights authorizes director of public service to enter into a contract with Eli M. West for lighting 9 5-cluster posts for period of 5 years, top light to burn entire night, at monthly rate of \$3 a post, lighting company to look after upkeep of lights and posts.

**Brookville, Pa.**—The Solar Electric Co. will install a boulevard system of lighting along main streets. George W. Heber is secretary and general manager.

**Kittanning, Pa.**—George C. and Arthur M. Morgan, hydraulic engineers, 111 West Monroe St., Chicago, have been engaged to prepare plans for municipal electric light plant and waterworks system, to cost about \$125,000.

**Wessington, S. D.**—Plans are being made to install electric light plant at Wessington.

**Brigham City, Utah.**—The County Commissioners have granted town board of Mantu franchise to construct and maintain transmission line through Box Elder Canyon. This means that progressive town located five miles east of Brigham soon will be equipped with electric lighting system. Town proposed to purchase power from Brigham.

**Seattle, Wash.**—City Council has adopted resolution providing for installation of cluster lamps on Madison St. from Railroad Ave. to First Ave., bids for which will shortly be asked by A. L. Valentine, chairman Board of Public Works.

#### CONTRACTS AWARDED.

**Waukegan, Ill.**—The third and final opening of bids on installation of boulevard lighting system on Genesee and Washington Sts. has taken place, and contract for work was awarded to A. G. Gement, of Racine, whose bid for improvement was lowest. The amount of his bid was \$9,678.

**Spring Lake, Mich.**—Contract has been let to John Bramer for concrete boulevard light poles for Maple terrace, Spring Lake's smartest residence section. These poles are made after design gotten out by Mayor Robbins, of Grand Haven, being a massive ornamental column of cement, topped with cluster of spherical light globes. These will be placed in center of parkways in William St.

**Plainfield, N. J.**—For replacing of gantry crane at Marion power station, Public Service Electric Co. is installing similar apparatus of much greater capacity. Last of contracts for job has just been awarded to Hobins Conveying Belt Co., of New York, which concern will construct an electrically operated and magnetically controlled gantry bridge at a cost exceeding \$50,000.

**East Rockaway, N. Y.**—By Village Trustees contract with Queensborough Gas & Electric Co., of Far Rockaway, for lighting streets of village. Contract calls for 117 40-watt tungsten lamps.

#### FIRE EQUIPMENT

**Seymour, Conn.**—Purchase of auto chemical truck is planned.

**Suffield, Conn.**—Purchase of combination hose and chemical truck is being considered.

**Miami, Fla.**—Purchases of 85-ft. aerial truck is being discussed.

**Kokomo, Ind.**—Movement to motorize fire department has been started at meeting of the Council. Councilmen all expressed themselves in favor of buying new motors, at least one each year. Mayor was in favor of motorizing entire department.

**Whitchita, Kan.**—Resolution has been passed by Council for purchase of 1,000 ft. of hose. A. G. Walden is Chief.

**Salem, Mass.**—At meeting of Salem Rebuilding Commission, resolution has been adopted recommending to City Council that tractor be purchased for Engine 1 and that this piece of apparatus then be housed on Saltonstall school site.

**Hannibal, Mo.**—Motor apparatus may shortly be purchased.

**Dover, N. J.**—Fire bonds in sum of \$15,000 will be sold Oct. 16 for erection of addition to municipal building.

**Babylon, N. Y.**—Board of Fire Wardens is urging purchase of 500 ft. of hose.

**Buffalo, N. Y.**—Fire Commission will purchase 8,000 ft. of hose. B. J. McConnell is Chief.

**Peekskill, N. Y.**—Purchase of motor-driven apparatus is petitioned for by Cortlandt Hook and Ladder Company.

**Watertown, N. Y.**—Fire committee of board of safety has inserted item of \$4,000 in its requisition for training and hose tower.

**Wilmington, N. C.**—Council has adopted resolution appropriating sum of \$7,500 for purpose of paying for construction of new fire station, now in course of construction at 5th and Castle Sts.

**Amherst, O.**—Village Clerk C. J. Aschenbach will advertise for bids for motor combination chemical and hose wagon.

**Canal Dover, O.**—Purchase of triple combination car is being considered.

**Cincinnati, O.**—Erection of fire engine house in Lewisburg is being planned.

**Girard, O.**—City will shortly dispose of \$15,000 in bonds which have been authorized for constructing and equipping building with modern fire fighting apparatus and a truck.

**Newark, O.**—City is considering bond issue of \$12,000 for purchase of motor ladder truck, a motor hose wagon and a motor police patrol.

**Sandusky, O.**—Bids will be received by F. W. Bauer, City Auditor, until noon, Oct. 31, for purchase of bonds in sum of \$25,000 for erection of Central Fire Station No. 1.

**Urbana, O.**—Election will be held shortly to vote on whether or not motor apparatus should be purchased.

**Portland, Ore.**—Two new pieces of auto-driven apparatus are to be purchased for Portland Fire Bureau. These include one hook and ladder truck and a three-tank chemical wagon. They will cost approximately \$12,000. Both of these pieces of apparatus will be installed on East Side in place of horse-drawn apparatus.

**Connellsville, Pa.**—Purchase of automobile chassis is being considered.

**Meadville, Pa.**—Bids have been received for fire hose, and referred to Superintendent of Public Safety.

**Miner's Mills, Pa.**—Borough Council has approved of ordinance authorizing purchase of fire alarm equipment.

**Philadelphia, Pa.**—New loan bill just been prepared calls for item of \$100,000 for purchase of motor apparatus.

**Reading, Pa.**—City will ask for bids for furnishing motor ladder truck for Marion Fire Company. A tractor-drawn truck may also be considered.

**South Bethlehem, Pa.**—Fire Committee has been authorized to purchase 200 ft. of 1-in. chemical hose for Monocacy Hose Company and new suction hose for Central steamer.

**Lead, S. D.**—City will probably purchase motor combination chemical and hose wagon in 1915. W. E. Foglesong is Fire Commissioner.

**Dallas, Tex.**—Police and Fire Commissioner Louis Blaylock has recommended purchase of 2,000 ft. of new hose for fire department.

**Fort Worth, Tex.**—A new \$8,250 American-La France combination motor and pumping fire fighting engine, with capacity of 800 gallons per minute, will be purchased by city of Fort Worth, and packing houses and stock yards company. City will pay half cost and packing interests half.

**Wheeling, W. Va.**—Improvements will be made to Fire Department, a combination motor truck and ladder to be placed at old hook and ladder house on 20th St. This is considered first real move towards motorization of Fire Department.

#### CONTRACTS AWARDED.

**Tama, Ia.**—To Obenchain & Boyer Co., of Logansport, Ind., contract for chemical engine, at \$600.

**Taunton, Mass.**—Contract for new fire station has been awarded to Franklin D. Williams at \$7,295.

**Fremont, Neb.**—By Board of Public Works, to Electric Garage, for furnishing White auto fire truck, at cost of \$3,999.

**Cannadagua, N. Y.**—To Star Electric Co., Binghamton, N. Y., for alarm equipment.

**Cohoes, N. Y.**—Mayor James S. Calkins has signed contract with American-La France Engine Co., of Elmira, N. Y., for furnishing of four pieces of motor-driven apparatus for fire department at cost of \$20,000.

**Mechanicville, N. Y.**—Bids and specifications for construction of new motor fire truck to be purchased by W. L. Howland Chemical Company No. 5 of local fire department, have been opened by purchasing committee of company and contract for apparatus awarded to Brockway Motor Truck Co., of Cortland.

**Girard, O.**—By Village Council, contract for constructing new fire station, to Timothy Behan, of Youngstown, at bid of \$6,654.

**Marion, O.**—For furnishing a 900-gal. motor combination pumping engine and hose wagon, and one 750-gal. motor triple combination wagon to Robinson Fire Apparatus Mfg. Co., St. Louis, Mo., at \$9,675, and to Seagrave Co., Columbus, O., at \$9,800, respectively.

**Marietta, O.**—Contract for new tractor for aerial truck of Fire Department has been awarded Robinson Fire Apparatus Mfg. Co., of St. Louis, on its price of \$2,995. New tractor will be of the latest type.

**Hastings, Pa.**—The Hastings Fire Company has closed contract for purchase of

chemical cart from American-La France Company, at cost of \$337.

**Wheeling, W. Va.**—Contracts for \$4,000 worth of fire hose have been awarded to following companies: The Revere Rubber Co. and the Republic Rubber Co. received contract for 1,000 ft. each, and Bi-Lateral Hose Co. and the Empire Rubber Co. contract for 1,000 ft. each.

#### BRIDGES

**Oakland, Cal.**—Plans are being prepared by P. A. Haviland, County Surveyor, of Alameda County, for repair of three bridges spanning the estuary. Estimated cost \$30,000.

**Sacramento, Cal.**—Bids will be advertised for construction of concrete bridge across Alder Creek.

**Stockton, Cal.**—An additional contemplated improvement is construction of modern bridge over Mormon Channel at East St., opening a new route to Mariposa Road.

**Yuba City, Cal.**—See "Streets and Roads."

**Richmond, Ind.**—County Commissioners have received and approved plans for bridge improvements in county amounting to about \$3,000. Bids will be asked on following improvements in next few weeks: Doddridge bridge over Noland's fork in Washington township fill on approach. Smith bridge over Elkhorn in Boston township, 75-ft. span, new bridge. Davis bridge, in Green township, 20-ft. span. Turnpaugh culvert, Jefferson township, 10 ft. Stewart culvert, Jefferson township, 12 ft.

**Richmond, Ind.**—Wayne County Council is considering construction of bridge over Whitewater River at cost of \$100,000.

**Hutchinson, Kan.**—State Board of Corrections and the Reno County Commissioners will join in putting permanent bridge over Cow Creek on road west of Reformatory wall.

**Pittsburg, Kan.**—Clerk has been ordered to advertise for bids on construction of concrete bridge on Quincy Ave.

**Landisfield, Mass.**—At special town-meeting it was voted to raise \$5,000 to pay Sunderland's share in strengthening Connecticut River bridge.

**Ecorse, Mich.**—Citizens will vote on question of bond issue of \$35,000 for building a bridge over Ecorse Creek at fall election.

**Billings, Mont.**—A bond issue of approximately \$75,000 for construction of bridges over Yellowstone River at mouth of Duck Creek and at Pompeys Pillar will be decided by voters of Yellowstone County. County Commissioners have ordered that notices of election be published. Bond issues for each bridge will be as follows: Mouth of Duck Creek, \$32,000; Pompeys Pillar, \$45,000.

**Elizabeth, N. J.**—Freeholders will shortly pass on \$35,000 bridge bond issue.

**Passaic, N. J.**—See "Streets & Roads."

**Plainfield, N. J.**—Final authorization for issue of \$35,000 bridge bonds by county is listed for action at meeting of Union County Board of Freeholders. The bonds are to be sold at public sale.

**Cleveland, O.**—Movement to petition Council to authorize \$750,000 bonds for reconstruction of old Superior viaduct is about to be launched.

**Massillon, O.**—Bids for contract to build Volkmar bridge across Hess Ditch in Perry Township have been opened in office of County Commissioners. Five bids were received as follows: Hahn Bros., Canton, \$2,749.28; Fred Heisler, Massillon, \$2,889.75; Frank L. Cox, Kensington, \$2,855.90; R. J. Vaughn, Akron, \$2,773.

**Philadelphia, Pa.**—Chief of Survey Bureau is preparing plans for constructing steel and concrete bridge over railroad tracks at Glenwood Ave. and 7th St., to cost about \$40,000.

**Philadelphia, Pa.**—New bridge over Port Richmond branch of Reading Railway is being discussed.

**Knoxville, Tenn.**—Construction of a concrete viaduct across First Creek and East Clinch Ave. has been recommended by J. Boyd McCalla, city engineer. His estimate of cost is \$6,000.

**Cameron, Tex.**—Commissioners' Court has let contract with Austin Bros., of Dallas, for erection of certain bridges in road district No. 2 for sum of \$11,366.50.

**Dallas, Tex.**—Four bids upon proposed bridge across Ten Mile Creek, on Millers Ferry road and number of other bids for improvements to be made on that road in same vicinity and near Ferris have been opened by County Commis-